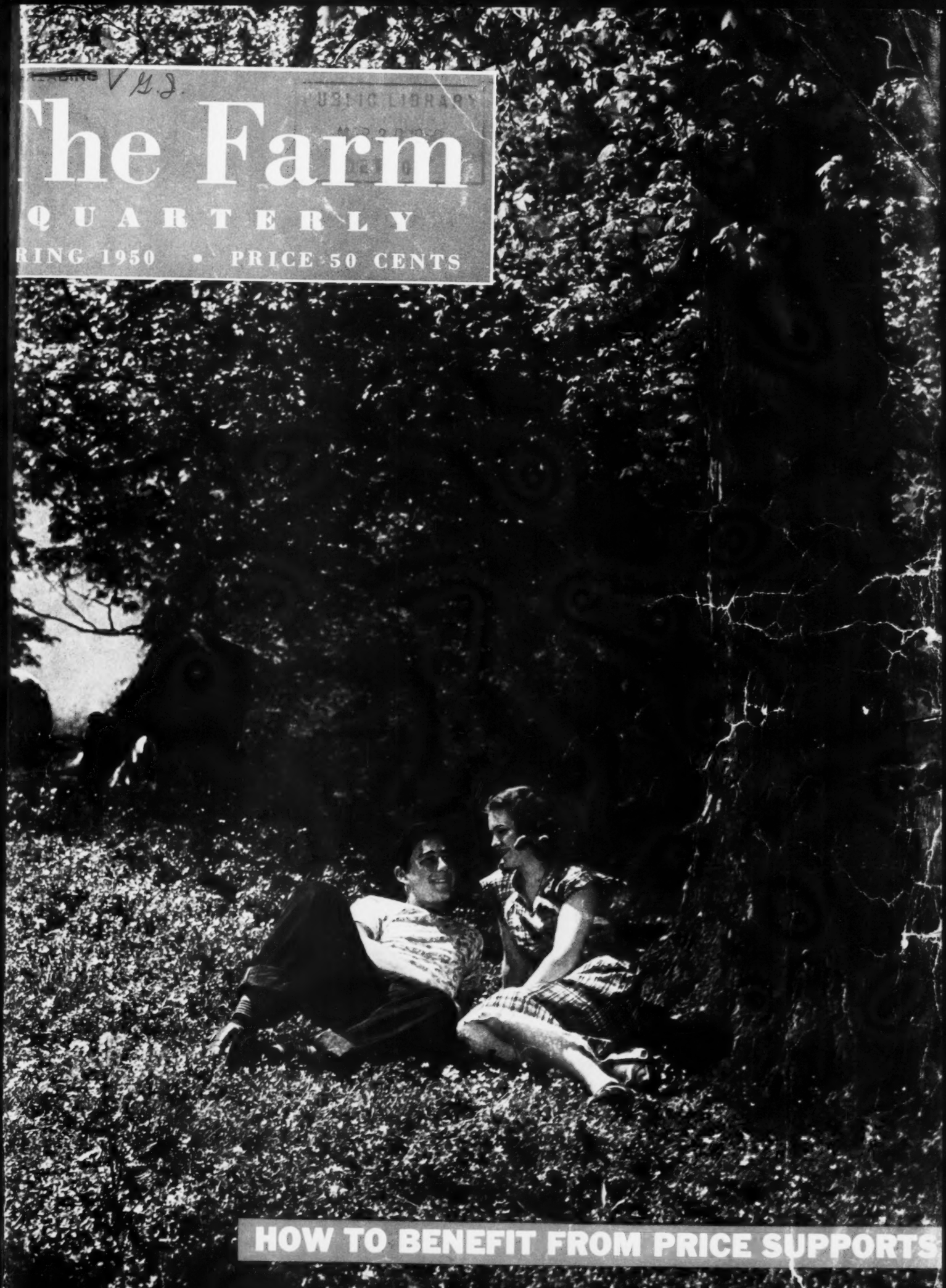
V42.

The Farm

QUARTERLY

RING 1950 • PRICE 50 CENTS



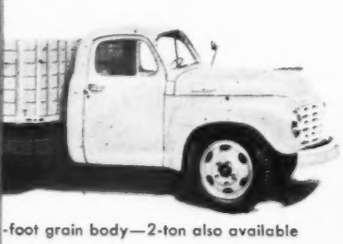
HOW TO BENEFIT FROM PRICE SUPPORTS

R v.5 1951/1952

ot stock rack—1½-ton also available

k-up—¾-ton (shown) or 1-ton model;
foot pick-up also available

atform stake—2-ton also available



-foot grain body—2-ton also available

ulated milk body—2-ton also available

Power-packed Studebaker trucks excel in low operating cost

Sizes and wheelbases for hundreds of needs

THIS year, keep more of your farming income untouched by the usual outgo for truck operating expenses.

Haul your loads the modern economy way—get a husky, handsome, trustworthy new Studebaker truck.

Get the stand-out pulling power—and the stand-up staying power—of a Studebaker Econ-o-miser or Power-Plus truck engine—the "tops-in-thrift" engines of the motor truck world.

Get ruggedness that counts—and get it where it counts—with a Studebaker truck's "plus" of frame length for maximum load space—with tremendously sturdy rear axles—with exceptionally strong spring front and rear.

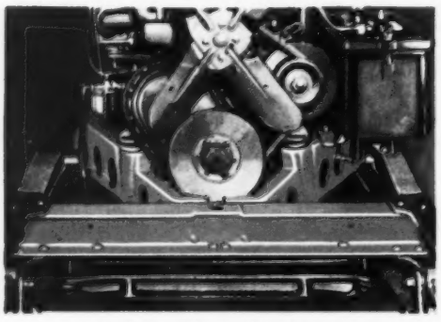
Get a Studebaker truck and a roomy big-vision cab—with weather-protected steps enclosed inside the doors. It's the "day-long-comfort" cab that drivers call America's finest.

Check up on the solid value that puts Studebaker trucks out ahead. Stop in at any nearby Studebaker showroom.

STUDEBAKER TRUCKS

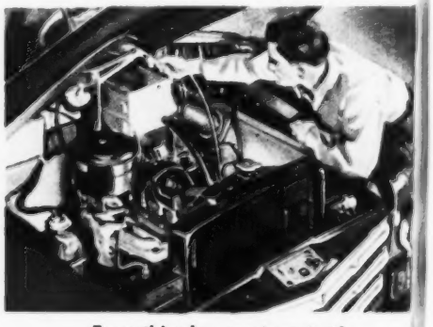
Noted for low cost operation

© 1950, The Studebaker Corporation, South Bend 27, Indiana, U.S.A.



Exclusive K-member frame!

Look at that massive, rigid K-member! It's used in all Studebaker trucks. It gives firm support to the engine mounts—reinforces the truck's whole front structure. It's one of many wear-resisting features that give Studebaker trucks extra value.



Everything's easy to get at!

No standing on a box is necessary when you w to service a Studebaker truck. The wide-open hood and close-set fenders provide real "lift-t hood" accessibility. Engine, ignition and inst ment panel wiring are within easy arm's rea

GI

Farmall Super-A with a McCormick A-218 rear-mounted corn planter. IH makes planters in great variety for this 1-plow tractor.

Farmall Cub with the Cub-435 vegetable planter . . . one of the full line of McCormick planters available for this and other Farmalls.

Why you'll like your New FARMALL* *at PLANTING time*

*Farmall is a registered trade-mark of International Harvester Company

When the season's right and the soil is right, you want to get your seed into the ground *fast*, before the weather changes. That's one of the jobs at which the five Farmall tractors excel.

All Farmalls make those time-saving, pin-point turns, and need only the narrowest headlands. Farmall Touch-Control or Lift-All lets you raise and lower direct-connected planters with finger-touch ease.

You'll find in a Farmall every other feature you want at planting time, too . . . wheel treads adjustable to suit all regular row-crop spacings . . . a clear view of where you're going and what you're doing . . . and a *complete* line of easy-on, easy-off McCormick planters, including the type you need in the right size to fit the Farmall you choose.

Farmall tractors are built *only* by International Harvester. So see your IH dealer. He can arrange convenient payment terms if you wish.

Farmall C with a McCormick C-220 forward-mounted corn planter. Notice how the trim Farmall chassis gives the operator a clear view ahead. You see *both* planting units.

Farmall H, a full 2-plow tractor, planting corn with a McCormick forward-mounted planter which includes fertilizer units, available with all McCormick planters.

Tune in James Melton and "Harvest of Stars" NBC, Sunday afternoons

INTERNATIONAL HARVESTER

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Get these helpful FREE booklets

Here's real help in deciding which tractor or tractors will serve you best . . . big, well-illustrated booklets that tell all about each Farmall and what it will do. Check below the booklets you want and mail the coupon today. No cost, no obligation.

International Harvester Company, P. O. Box 7333, Chicago 80, Illinois, Dept. E

Gentlemen: Please send me the booklets on the tractors checked below. I farm _____ crop acres; principal crop is _____

☐ Farmall Cub ☐ Farmall Super-A ☐ Other Farm Equipment
☐ Farmall C ☐ Farmalls H and M _____

Name _____

Post Office _____ State _____

My IH Dealer is _____

Farm Profits start RIGHT HERE

DEARBORN MOLDBOARD PLOW gives what farmers want: even depth, clean cut furrow and a well-turned furrow slice.

Get PROOF that the Ford Tractor and Dearborn Ground-Breaking Tools Pay BIGGER RETURNS

High yields start with good seed beds, prepared in the least possible time and at lowest possible cost. That's where Ford Tractor owners cash in—on low first cost of their equipment—on time and labor saved—and on low costs of operation. Tens of thousands of Ford Tractor owners are proving this on farms in every part of America this year. *You* can prove it with a demonstration right on your own farm. Just tell your nearest dealer that you'd like to see for yourself what Ford Tractor *full two-plow performance* means in better, faster, more economical ground breaking and seed bed preparation.

DEARBORN DISC PLOW and Ford Tractor are great for very "difficult" soils. Fine also for making terraces.

DEARBORN TWO-WAY PLOW throws all furrows one way; leaves no back or dead furrows. Very good for hill fields.

DEARBORN MIDDLEBUSTER makes seed beds for listed or bedded crops. Attachment available for planting.

TOWNER LIFT-TYPE OFFSET DISC HARROW does an excellent job in orchards; gets in under the trees.

Dearborn
FARM EQUIPMENT

Ask your dealer for a demonstration

Your nearby Ford Tractor and Dearborn Implement dealer will gladly demonstrate the Ford Tractor and any equipment you are interested in, on your own farm at any time. You can depend on him, too, for expert service and genuine parts, plus sincere interest in helping you make the most of your farming opportunities.

FROM IOWA: "Have plowed wet ground where another tractor almost stuck just passing through." L.J.F.*

FROM WISCONSIN: "One could never believe the power they (Ford Tractors) have for plowing until you use one yourself." M.G.S.*

FROM WYOMING: "Have compared my Ford against (three other tractors) with two bottoms and out-plowed them all on heavy soil." J.S.*

FROM NEW YORK: "The Ford Tractor will plow on a side hill where other tractor could not plow." A.A.*

FROM WASHINGTON: "With the Dearborn Plow, it is much easier to plow peat and trashy ground." J.H.*

FROM NORTH CAROLINA: "The hydraulic lift saves strain on muscles and lifts plows for easy turning." A.F.C.*

**Names and addresses of farmers quoted above will be supplied on request.*

DEARBORN MOTORS CORPORATION
DETROIT 3, MICHIGAN

COPYRIGHT 1951, DEARBORN MOTORS CORPORATION

Ford Farming MEANS LESS WORK . . . MORE INCOME PER ACRE

Now you can get...

THE FAMOUS Firestone

CHAMPION CURVED BAR TRACTOR TIRE in Either OPEN CENTER or TRACTION CENTER Design

SOME farmers prefer Open Center tires, while others demand Traction Center. Regardless of the type *you* prefer, Firestone has it. No one else offers you a choice, because Firestone alone provides both tread designs.

If it's Open Center design you want, see the sensational new Firestone Champion Open Center, Curved Bar Tractor Tire. Try it — for traction, for cleaning, for smoothness on the highway, for all around performance. You'll find it's away ahead of any open center tire ever made.

If it's the Traction Center Tire you want, there's only one — the patented Firestone Champion. This tire has long been recognized by thousands of farmers the country over as the top performer for year-around work. A test on your own farm will show you.

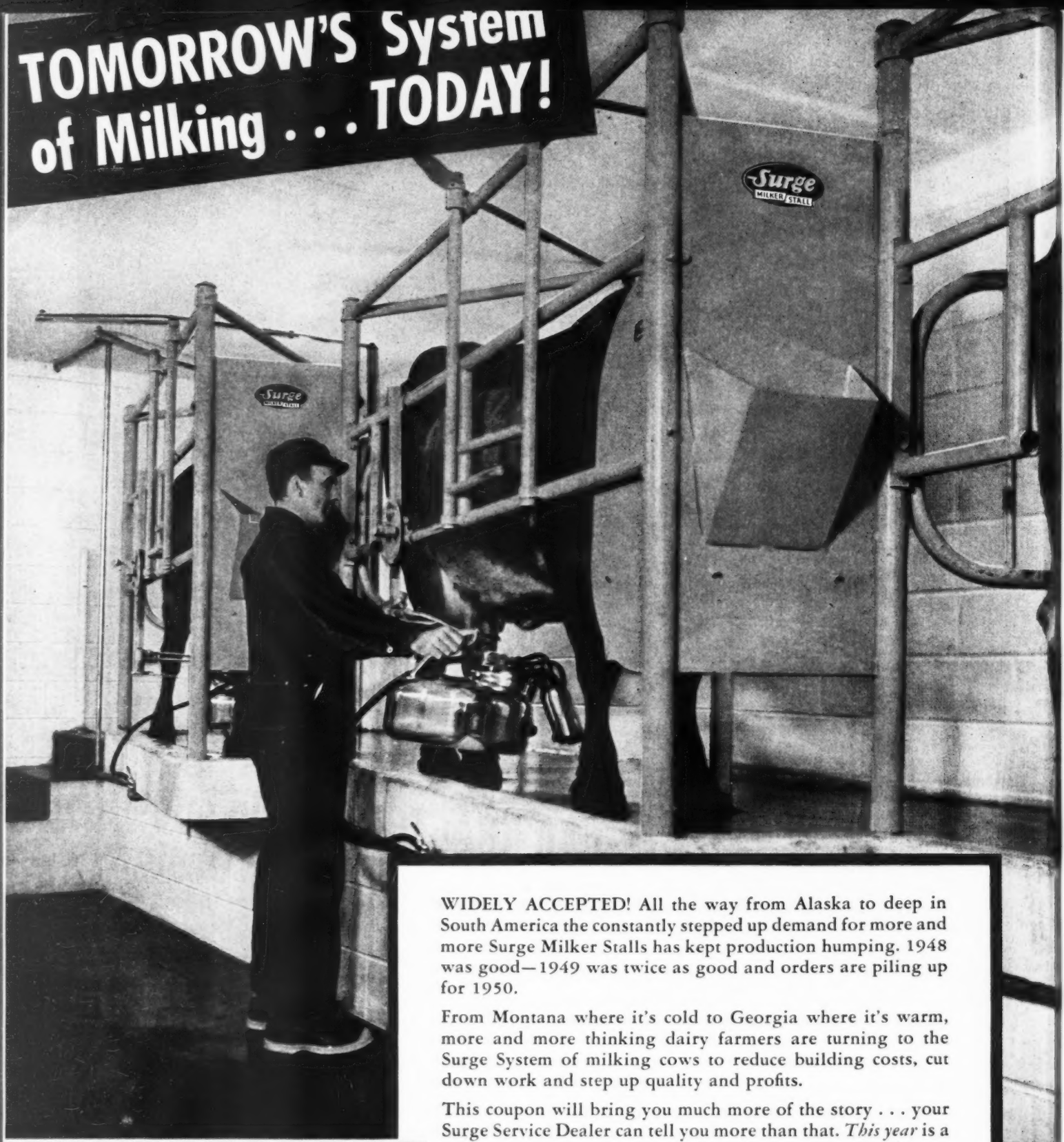
So again we say, regardless of your preference in tractor tire tread design, see your Firestone Dealer, your Implement Dealer, or Firestone Store. There's no need to shop around any more. *Firestone has everything in tractor tires.*

Listen to the Voice of Firestone every Monday evening over NBC

Always Buy Tires Built by FIRESTONE, the Originator of the First Practical PNEUMATIC TRACTOR TIRE

Copyright, 1950, The Firestone Tire & Rubber Co.

TOMORROW'S System of Milking . . . TODAY!



WIDELY ACCEPTED! All the way from Alaska to deep in South America the constantly stepped up demand for more and more Surge Milker Stalls has kept production humping. 1948 was good—1949 was twice as good and orders are piling up for 1950.

From Montana where it's cold to Georgia where it's warm, more and more thinking dairy farmers are turning to the Surge System of milking cows to reduce building costs, cut down work and step up quality and profits.

This coupon will bring you much more of the story . . . your Surge Service Dealer can tell you more than that. *This year* is a mighty good year for *you* to find out all about the Surge System of Milking Cows. Many men in many places like it very much!

BABSON BROS. CO.
2843 W. 19th St., Chicago 23, Ill. Dept. 2793

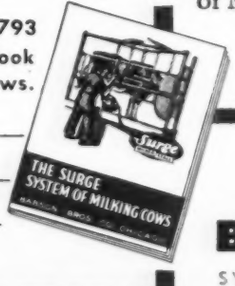
Gentlemen: Please send me your Free Book describing the Surge System of milking cows.

Name_____

Address_____

State_____

I MILK_____ COWS
(number)



Built under more of the ing patents 2,477,0 Des. 157 Re. 23 Re. 23 other pat pend

Surge
SYSTEM of MILKING COWS

Copyright 1950 Babson B

BABSON BROS. CO., Chicago 23, Il

SYRACUSE • HOUSTON • EL MONTE (Calif.) • KANSAS C
TORONTO • ATLANTA • SEATTLE • MINNEAPO

COMING IN SUMMER

The Indians of Ecuador farm the slopes of the mist-shrouded peaks of the Andes mountains, growing tropical crops in the valleys, corn and other temperate zone plants higher up, and cold weather crops as high as crops can be grown. John and Mary Collier, who recently returned from Ecuador where they lived among the Indian farmers, have brought back to The Farm Quarterly as interesting an article, in story and pictures, as we have ever published.

For more than a year one of our editors has been watching a bunch of feeder calves grow into beef. "The Tale of a Calf" will take a range calf from birth through its first winter, its pasture and feedlot management the following year, and finally to market. This article is aimed at taking the gamble out of feeding cattle.

When the young farmer starts to take over the management and operation of his father's farm he is confronted with a number of delicate problems. Will the improvements he makes on the farm be his or will they work to his detriment by making the farm more expensive to buy back from the other heirs when the father dies? How can the farm be transferred to the farmer-son without encroaching on the rights of the other heirs? What happens to the farm if the farmer dies without leaving a will? These and other practical problems are discussed in an article on father-son relationships.

Since summer is the time of county fairs, or the time of preparing for them, the coming issue of Farm Quarterly recaptures in words and pictures the atmosphere of a county fair typical of hundreds like it across the country.

"The eye of the farmer fatteneth the ox," so the old saying goes, yet there are farmers who have never seen their land nor looked over their livestock, who do a fine job of farming. These are the blind farmers of America who operate their farms with an efficiency that would excite the envy of many a seeing farmer. The problems of the blind farmer and the school which is operated to teach farming to the blind are described in an article prepared by one of our editors.

A profile on the legendary Johnny Appleseed, a delightful story on the family life of the Bobwhite, soils articles on fumigation, soil bacteria and dust storms, and the place of milk feeds in the poultry industry round out the Summer issue of the Quarterly, planned to make hot weather reading a pleasure and a profit.

THE FARM QUARTERLY

22 East 12th St., Cincinnati 10, Ohio

R. J. McGinnis.....**Editor**
Fred Knoop.....**Executive Editor**
Grant Cannon.....**Managing Editor**
George Laycock.....**Associate Editor**
Joe Munroe.....**Staff Photographer**
Edna O'Connell.....**Editorial Secretary**
Wm. D. Zaeh.....**Production Manager**
J. W. Pace.....**Circulation Manager**
Aron M. Mathieu....**Business Manager**

Contents

THE FARM QUARTERLY

Spring 1950 Vol. 5 No. 1

	Page
STOCK	
The Reluctant Mule	30
The Tag On The Bag	34
The Cattle Grub	52
Breeds Of Sheep	78
SOIL	
The Biggest Plow In The World	28
Food Where Crops Need It	66
The Borders Treatment	82
CROPS	
Rye, Soil Builder and Forage	38
Kudzu	54
The Forage Harvester	72
FEATURES	
How To Benefit From Price Supports	22
Spring Almanac	40
The Silent Farmers	44
The Eternal Plague	58
Farm Fires	60
The Goose Is Coming Back	64
New Bees For Old	70
Hog Dog	76
DEPARTMENTS	
Letters	8
Farm Books	14
The Dairy Barn	16

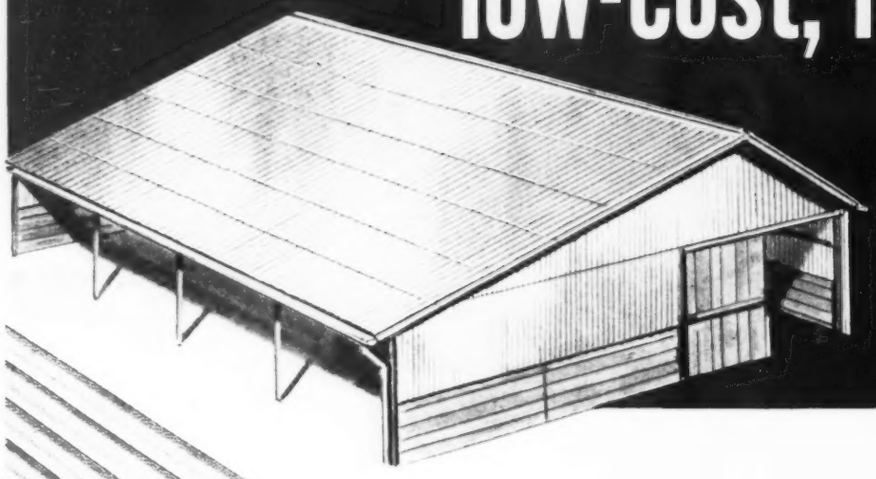
Contributing Editors: **Myron S. Hazen, G. N. Hoffer, Charles Krutch, C. M. Long, George D. Scarseth, Katharine A. Smith.**

Volume Five Number One. Entered as second-class matter February 20, 1946, at the Post Office at Cincinnati, Ohio, under the Act of March 3, 1879. Published quarterly by The Automobile Digest Publishing Company, Cincinnati, Ohio, Publishers of The Farm Quarterly, The Automotive Digest, Modern Photography, Writer's Digest and technical books.

Copyright, 1946.

Subscription price 50c a copy; $2.00 for one year; $3.50 for two years; $5.00 for three years. Rates outside the U.S.A. and Canada, 1 year @ $3.00; 2 years @ $5.50; 3 years @ $8.00. Remit by postal money order or check to The Farm Quarterly, 22 East 12th Street, Cincinnati 10, Ohio. Title Reg. U. S. Pat. Off.

Build this low-cost, labor-saving Doane Pole-Frame Barn



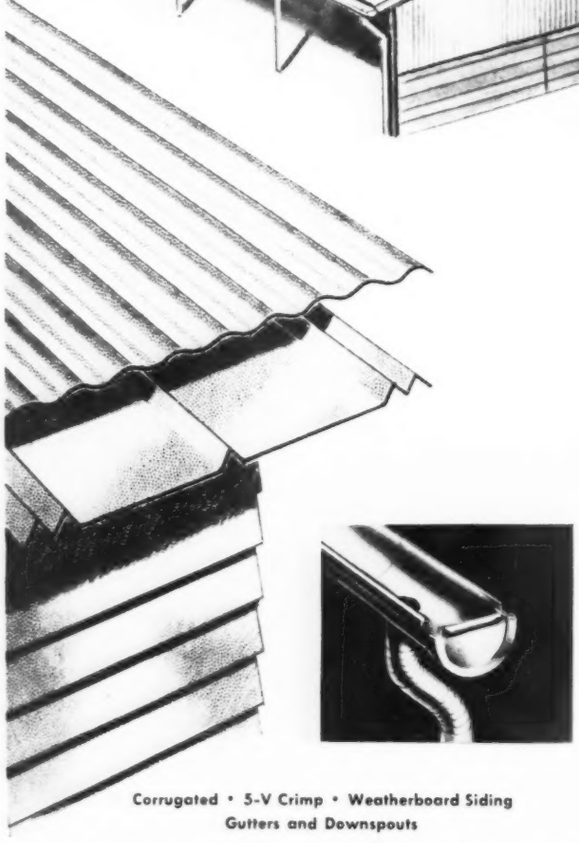
with REYNOLDS *Lifetime* ALUMINUM

This pole-frame barn can be built for *half the cost* of a conventional barn. And it *cuts in half the labor* of handling feed and livestock.

You get down-to-earth operating economy from this single-story construction—no "overhead." Hay and bedding, chopped or baled, are stored at ground level—right were they are to be used. Tractor loader removes manure through open side. It's a barn your livestock like and can pay for!

The basic principle of this design is the frame of chemically pressure-treated poles sunk five feet into the ground. The poles serve both as supports and anchors. Excavations, footings and foundations are eliminated. Sawing is reduced to a minimum. Building is almost as simple as putting up a fence—just set the poles and nail the rest.

This type barn, designed and widely tested by the Doane Agricultural Service, is the first of a series of improved farm structures made available through the services of Reynolds Farm Institute. For detailed plans, including directions for construction, list of materials and sources for treated poles, send $5.00 with the coupon.



Corrugated • 5-V Crimp • Weatherboard Siding
Gutters and Downspouts

For rustproof permanence without painting, for fire resistance, corrosion resistance, easier application and radiant heat insulation summer and winter . . . build with Reynolds *Lifetime* Aluminum. Use any combination of the roofing and siding shown, with half-round or ogee gutters. All available in stipple-embossed or smooth finish . . . see your dealer!

Another service of Reynolds Farm Institute

REYNOLDS ALUMINUM FARM INSTITUTE

Reynolds also serves the farmer with Aluminum Cable (ACSR), Portable Irrigation Pipe, Siphon Tubes, Paint Pigment and Freezer Foil.

Reynolds Metals Company,
Building Products Division Louisville 1, Kentucky

Q-2

REYNOLDS FARM INSTITUTE, Box 1800, Louisville, Ky.

Please send me ☐ **FREE "Aluminum Adaptor Plan"**

☐ **FREE 8-page Catalog of Aluminum Farm Building Products**

I enclose $5.00 (check, cash or M.O.) for which please send me full set of Doane Pole-Frame Barn plans.

Name_____

Address_____

"This Kind of Help...I Like!"

We've had many letters of appreciation for the feeding information and balanced formulas contained in our new book "Feed Supplements and Proved Formulas." A free copy is yours for the asking. Write Dept. A,

JOSEPH E. SEAGRAM & SONS, INC.

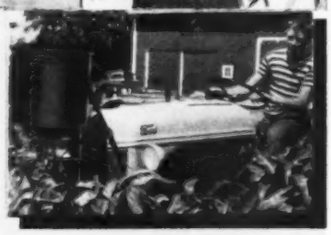
GRAIN PRODUCTS DIVISION • BOX 240, LOUISVILLE 1, KENTUCKY

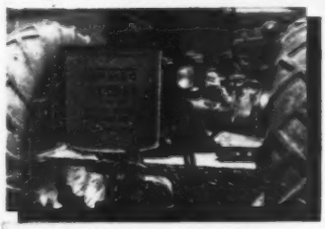
Seagram...SERVICE TO AGRICULTURE

Farmer Feeder says:

IT'S FARMER FEEDER EQUIPMENT FOR ME EVERY TIME!

COVER CROP SEEDING *made easy* with the *All Electric* FARMER Broadcast SEEDER

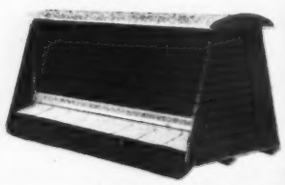


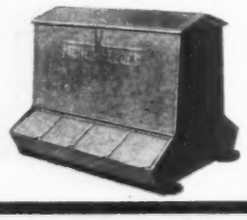


★ Developed to sow any seed or grain that can be broadcast, is powered from the tractor, car or truck battery and NOT operated from power take-off, comes complete with individual electric motor. Sows up to 20 acres per hour.

WOOD STEEL CLAD FEEDERS

★ Feature suspended mechanical agitators, heavy galvanized steel lids, are finished with two coats of high gloss enamel for extra weather protection.



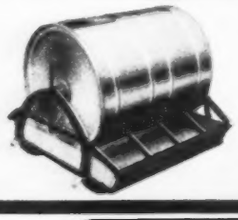


ALL STEEL FEEDERS

★ Made of heavy galvanized steel, supported by oak runners with tow eyes. These feeders are non-tilting and lead the field in modern design. Available: No. 4 and 6.

SUMMER-WINTER FOUNT

★ Sturdy construction, capacity to accommodate about 100 hogs, large exposed watering surface, tank holds approximately 85 gallons. Heaters and panels optional.



ROLL-A-VAC FOUNT

★ This summer-type fount is easy to fill, clean, and move. Simply roll up opening for filling, then roll down for operation. Consists of Drum, Guard Frame, Pan and Skid.

FARMER FEEDER Company, Incorporated

CAMBRIDGE CITY, INDIANA

Please send me FREE Illustrated Literature showing the complete Farmer Feeder Line.

NAME_____

ADDRESS_____

CITY_____ STATE_____

WHAT ARE LITTLE PIGS MADE OF?

Sir:

Some few weeks ago I purchased from your book department "Swine Enterprises." I think it is a wonderful book. But one item I wish you could enlighten me on is, the use of municipal garbage for hog feed. They have a system here of gathering all the garbage from Los Angeles and the surrounding cities and selling it by the ton to hog raisers. I could never advocate feeding that filth to anything as stated on page 330 of Swine Enterprises. They claim that they raise them on garbage and a few weeks before slaughtering give them a good clean feed to clear the hog's system. That could never be swallowed by me. Good, clean garbage is one thing but that filth they feed the hogs, nothing doing!

One of my neighbors told me they made perfume of garbage in New York. I told him they did that plenty around here.

Santa Monica, Calif. Wm. Newenham

SHOULD FIGHTING COCKS FIGHT?

Sir:

I read your story, (Death At Midnight, Winter 1950). The construction was beautiful, the theme was putrid.

From history I can see a Roman audience in the time of Caesar laughing with glee while two little innocent roosters fight one another to the finish. However, our respect today for that Roman audience isn't as great as it could be. We feel they showed a certain savage instinct. Therefore, I feel that in 2000 years man should have come just a little farther down the tree of civilization.

Patricia Ann Lillenbeck

Sir:

"Death at Midnight" is a thrilling detailed account of a fine age-old sport. This alone is worth the price of an issue.

"Let the feathers fly" and may the best game cock win!

Fairfax, Calif. Owen Parsons

Sir:

You will probably receive a few protesting letters from vegetarians and the like. . . . .

L. O. Carlson

Sir:

Why publish an article like this. Young readers should not be given ideas on cock fighting, especially in your fine magazine.

Warren, Mass. Elias H. Cutler

Sir:

Cock fighting is disgusting in the extreme. Any story that gives, as this one does, a certain grandness or glory to the subject is a disgrace to human kind.

I know there is great cruelty and misery among men the world over. It is just as bad if not more so when man himself sets two animals against each other and perverts the entire act by betting on the winner.

Robert F. Stowell

Sir:

. . . . I find it so much waste space. . . .

Petersburg, Kentucky Mary V. Sellers

Sir:

I think Death At Midnight (Winter 1950) is informative and authentic, but certainly nauseating. I am not a prude but cannot see anything constructive in the narration of illegal pleasures in the type of magazine you publish. If your readers, especially the younger set, like this type of article, no doubt you will be encouraged to print the culture and use of the Marihuana weed.

Several years ago I was very much surprised to learn that a close acquaintance of mine had about two dozen fighting cocks in training just outside of town. It started as a hobby and ended up as a liquidation of his business.

Johnstown, Pa. H. A. Boland

GRAND CHAMPION ANGUS CALF

Here is Edward Derr, Jr., New Windsor, Md., with his Angus Calf which won the Grand Championship (Junior Class) at the Eastern National Show, Timonium, Md. Says Edward: "The calf weighed 450 lbs. at the beginning of the feeding period and weighed 1,060 at show time. I used Wayne Sweet Mix, oats and corn. 4 of grain to 1 of Sweet Mix. The calf had all of this he could clean up at all times with plenty of good alfalfa hay. You can see from the picture that this calf has unusual finish and conformation. The judges awarded him 1st not only because he was largest but because of the excellent finish, for which I give Wayne Sweet Mix much credit!"

CHAMPION JERSEY HEIFER

Above is shown the Champion Junior Club Heifer of the 1949 Wisconsin State Fair, Shi-Wa Valiant Fair, with her owner Audrey Anne Price, Kenosha. "We feed milk about 4 weeks—then switch to dry feed...mixing ground oats, ground shelled corn and Wayne Calf Pellets," says Audrey. "We continue this program until animals are about 6 months old. Alfalfa hay is provided after calf is 4 weeks old. We recommend Wayne Calf Pellets highly. Calves develop well with a smooth finish."

1ST 3 STEERS

In Junior Club work for several years, John White, Jr., Batavia, Illinois, this year won 1st in county group of 3 steers (above) in State of Illinois at the International in this division. His steers sold for $42.25 per cwt. "I fed Wayne Sweet Mix for my protein feed," states John. "I like it because it helps keep calves on feed, makes for fast gains and puts a lot of bloom on cattle for shows. I also fed Wayne Sweet Mix to a carload of calves this year. They weighed in at 366 lbs. average. After 13 months, they weighed out at 1,070 lbs. average or a 2 lbs. daily gain. They sold for $41.50 per cwt."

The Thrill of Winning!

PROUD AND HAPPY YOUNGSTERS TELL HOW THE WAYNE WAY HELPED THEM WIN TOP HONORS

The happy faces of these alert, wholesome farm boys and girls reflect justifiable pride in jobs well-done...jobs which demand painstaking care and management, as well as feeding programs of unfailing high quality.

They are typical of thousands of farm youths throughout America...who, along with their fathers and neighbors, depend year after year on the Wayne Way of feeding for top results and profits...in show-ring, contest, feed-lot or market place.

$7,560 GRAND CHAMPION ANGUS STEER

Says Patsy Rumple of Berne, Indiana:

"It was the thrill of my life when my Angus steer, Blackie, was judged Grand Champion at the 1949 Indiana State Fair. I bought him from my father, Henry Rumple, who is an Aberdeen Angus breeder.

To grow Blackie, I fed him corn, oats and Wayne Calf Pellets—then finished him with a mixture of our home grains and Wayne Sweet Mix.

My steer weighed 1,120 lbs. and was sold at auction for $6.75 per lb., netting me $7,560. This was the first time I showed at the State Fair in a class of over 400 steers. This was my 4th year in Junior Club work and I am going to try to feed another winner in 1950—the Wayne Way!"

ALL-BREED RESERVE CHAMPION "We weaned 148 pigs from 18 Wayne-fed sows," reports Harold Plahm (left) Farm Manager of Glenwood School for Boys, Glenwood, Ill., shown with Bob Graham and Herdsman Warren Page. "From these 148, we selected 3 pens of Yorkshire barrows for the International Livestock Exposition at Chicago—and were pleased to win Reserve Champion Middleweight Barrow (see photo), as well as 1st Lightweight Barrow and 1st Middleweight Barrow. We get excellent results with the Wayne Hog Feeding Program!"

Prove to yourself... IT PAYS TO FEED THE WAYNE WAY!

The successful experiences reported above are a tribute to *quality* breeding, feeding and management. You, too, can profit—in show-ring or feed-lot—by feeding the Wayne Way. See your friendly Wayne Feed Dealer now—or send coupon below.

Allied Mills, Inc., Ft. Wayne 1, Indiana
Send free feeding information on:

Chickens ☐ Turkeys ☐ Calves ☐
Hogs ☐ Dairy Cows ☐ Beef Cattle ☐
..... ☐
(other)

Name.....
Address.....
Town.....State.....

your "Hog Lot" tomorrow

free

☆ PLANS

☆ BLUE PRINTS

AND IDEAS FOR THE HOG FARM OF THE FUTURE

Here is a time-saving plan for feeding and management where every move counts. With it *one man* can raise up to 1000 hogs a year. Yes, it's the Semi-Solid System of Raising Hogs.

The complete Semi-Solid System is easy to adapt to your farm. It will give you the advantage of "down-the-line" feeding, "group litter" farrowing, "step-saver" sow handling.

Getting more from your feed, however, is the basic benefit of the Semi-Solid System . . . and this advantage can be yours right now. Just buy and start feeding Semi-Solid SOW and PIG Emulsion today. Fed according to the Semi-Solid System, these feeds can help you market hogs early — at an average feed cost of only 9 bu. of corn, 66 lbs. of protein supplement and 64 pounds of Semi-Solid Emulsions per 200-lb. hog. Order SOW and PIG Emulsion today from your local feed dealer.

CONSOLIDATED PRODUCTS COMPANY, 119 N. Washington, Danville, Illinois

Gentlemen: Please send me your FREE plans, blueprints and hog raising ideas as outlined by your Semi-Solid System.

Name_____

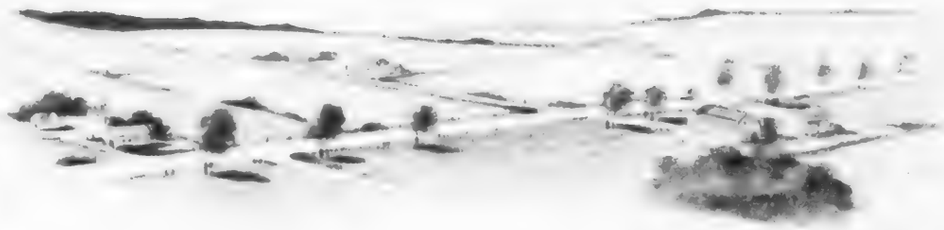
R. F. D._____ Town_____ State_____

"The Semi-Solid System" OF RAISING HOGS

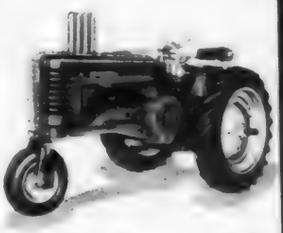
A JOHN DEERE TRACTOR
FOR EVERY FARM . . . CROP . . . PURPOSE

The 1-2-plow, one-row Model "M".

The 2-3-plow Model "A".



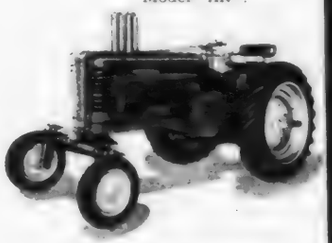
The 1-2-plow, two-row Model "MT"



The single-front-wheel Model "AN".

ULTRA-MODERN POWER
WITH
TWO-CYLINDER ECONOMY

The Model "MT" with single front wheel.



The adjustable-front-axle Model "AW".

Meet today's John Deere Tractor Family—18 great models—a type and power size for every farming need.

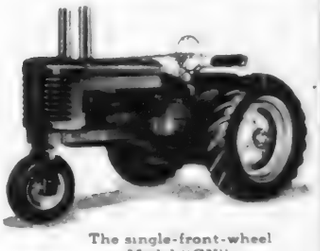
One of these John Deere Tractors fits *your* farm. The more you know about it the more convinced you'll be it's the best farm power investment you can make. So, pick out *your* tractor—write us for free literature describing it. Then, arrange with your John Deere dealer to see it and drive it. We feel sure you'll never be completely satisfied until you own a John Deere Tractor.

The Model "MT" with adjustable front axle.

The 3-plow Model "G".

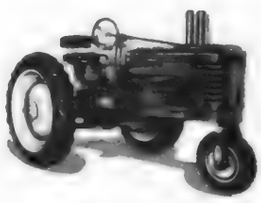
JOHN DEERE
MOLINE • ILLINOIS

The track-type Model "MC".

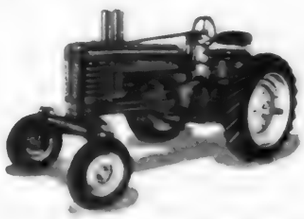


The single-front-wheel Model "GN".

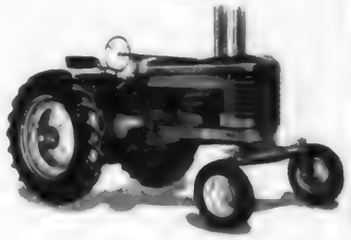
The 2-plow Model "B".



The single-front-wheel Model "BN".

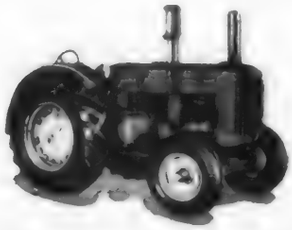


The adjustable-front-axle Model "BW".



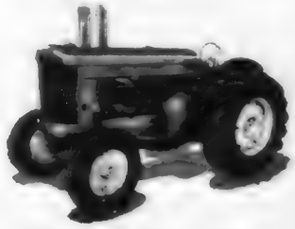
The adjustable-front-axle Model "GW".

The orchard Model "AO".



The 3-4-plow Model "D".

The 4-5-plow Model "R" Diesel.



The 2-3-plow Model "AR".

FIRST IN MODERN DESIGN . . . PROVED PERFORMANCE

penta-
chlorophenol

ESPECIALLY YOUR WOOD FLOORING and FOUNDATIONS and ROOFING

You can't afford to be without the protection against decay and termites that PENTAchlorophenol gives your barn!

Flooring, roofing and rafters al. last longer when PENTA-PROTECTED. Builders of the new, economical pole-type barns are enthusiastic about the clean PENTA treatment.

The labor saved by owning a barn that lasts years longer means more productive farming time for you. Hog and hen houses, and especially fence posts, are other places where the PENTA treatment will save you time and money.

For information about how to use PENTA fill out coupon and mail to: THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN.

"PENTA" is easy to use ★ can be applied cold ★ dries quickly ★ leaves wood clean

The Dow Chemical Company
Dept. PE 2
Midland, Michigan

Tell me more about PENTA and its use in
☐ BARNS ☐ FENCE POSTS ☐ _____

Name _____

Address _____

City _____ State _____

DOW
penta
chlorophenol

Sir:

It is evident the author of "Death at Midnight" has been around.

H. W. Davis

Sir:

I wish to say that I think it is a fine sample of what goes on out on the farm. Cock fighting is held here within a stone's throw of our community and has a large following. I am certain that the writer is only depicting true facts and has no other interest.

C. C. Cooper
Voc. Agric. Inst.
Luther, Okla.

Sir:

You have given the cock-fighters fair enough treatment, and yet you have pointed out the law breaking, gambling, brutality, etc. in pretty good style. I believe this article will arouse the people's feelings, so that ultimately some good should come from it.

Dr. W. A. Young
Managing Director
The Anti-Cruelty Society
Chicago, Illinois

Sir:

I have read your article entitled "Death at Midnight." When I finished the article I was of the opinion that this practice should not be continued in our country.

This article is worthy of reprint consideration by the *Readers Digest*. Should it secure such wide circulation it will have extremely great influence on the American sporting mind.

Murle M. Hayden
Superintendent
Lincoln City Schools
Lincoln, Kansas

Sir:

My opinion is that it is ridiculous to outlaw cockfighting; legal or not, the sport flourishes. Cockfighting is a far more desirable form of entertainment than bloody boxing matches or the Indianapolis Speedway, where thousands wait eagerly for that moment when some driver cremates himself.

A. B. Carter
Richmond, Kentucky

OLD TIMER'S APPROVAL

Sir:

I read a number of farm papers, one of which I have subscribed to for 69 consecutive years. And, incidentally, I have been on the same farm for 69 years.

I feel that my long experience in the farming business, and reading farm papers, qualifies me to judge the merits of a farm magazine. I congratulate you on measuring up to your caption, "A Magazine written for those who farm for profit."

W. B. Peden
Spencer, Ind.

WALKING HORSES NOT EXPENSIVE

Sir:

Your article on Walking Horses by Paul de Lott, (Summer 1949) interested me much. However, I believe the stated price of $500 and up for a fine well bred, registered yearling colt, is misleading. Such sums, and higher, have been paid but are by no means the rule.

I myself have some registered two and three year old geldings and a brood mare which I would gladly sell for a price like that. So far as breeding goes they are tops, they have the gaits, are gentle, easy rjding animals and are as intelligent as they come.

Walking horse breeders just don't have the buyers.

Nora Vogel
Coalmont, Tenn.

(Continued on page 138)

Drive the "Rocket" and Whirlaway!

A General Motors Value

ROCKET AHEAD WITH OLDSMOBILE

(Cars Illustrated) New "Rocket" Engine "98" 4-Door Sedan. New Whirlaway Hydra-Matic Drive optional at extra cost

Drive the car that makes distance an exciting adventure!

Drive an Oldsmobile—the *only* car with the smoothest "power package" ever built—the "Rocket" Engine and new Whirlaway Hydra-Matic Drive!

Drive the car with superb new sweep and flow in its styling—glamor in the finest Futuramic manner!

Command the car that wings you to your destination with brilliant, obedient response —*"Rocket" Engine* response!

Thrill to the car that delivers "Rocket" Engine power with incomparable smoothness —*Whirlaway Hydra-Matic* smoothness!

Discover the dramatic new experience of "Rocket" Engine teamwork with Whirlaway Hydra-Matic...soon.

Drive the "Rocket" and Whirlaway— in a new Futuramic *OLDSMOBILE!*

OLDSMOBILE OFFERS TWO BRILLIANT "ROCKET" ENGINE CARS FOR 1950—THE GLAMOROUS NEW "98"—PLUS THE FLASHING NEW "88," NOW AT REDUCED PRICES

DO EVERY JOB

better-faster-cheaper- WITH

COMPRESSED AIR

Paint Buildings, boats, tractors, trucks; refinish furniture and fenders; inflate tires; grease and lubricate motors, engines, implements. Destroy weeds. Rid livestock, poultry and pens of pests with portable air power.

Free Literature explains relative advantages of 4-cylinder **PRESSURE QUEEN** and single-cylinder **PRESSURE PRINCESS** spray painting outfits. Tells how to save material, time and money by using the proper outfit at the right price.

It Is Yours For The Asking
Write Today

THE CAMPBELL-HAUSFELD CO.
181 RAILROAD AVE. HARRISON, O.

MOW-MASTER
The Farmer's Choice

MOWS EVERYTHING

Saves
TIME
WORK
MONEY

TRIPLE DUTY
POWER MOWER

1. **Cuts tall weeds and grass.**
2. **Mows lawn velvety smooth.**
3. **Pulverizes leaves—No raking, hauling or burning.**

Farmers throughout the country are proving the rugged durability of MOW-MASTER Power Mowers. Built to deliver satisfactory service under the toughest mowing conditions . . Lighter than ever —handles like a dream. Amazing New Grind-a-Leaf attachment pulverizes autumn leaves and keeps yard neat and clean. Improved, 2 H. P. Power-Pak Engine furnishes surplus of smooth flowing power. See it at your dealers.

FREE BOOKLET "POINTERS ON MAKING GOOD LAWNS" and our MOW-MASTER literature sent upon request.

New Low Prices— *from* **$105.00** PLUS FREIGHT

PROPULSION ENGINE CORPORATION FQ 3
7th St. and Sunshine Rd. Kansas City 15, Kans.

Trade Mark Reg. U. S. Pat. Off.
Patents Granted and Pending

COMPETITIVE TESTS-

PROVE COBEY BEST!

The "sure drive" of the Cobey Power-Driven Spreader wins again! In a recent test with three competitive manure spreaders, the spread pattern of the Cobey was definitely best. Its finely shredded manure and wider, more uniform distribution proved that it gives more value per bushel of manure.

The 8-speed control gives you the exact amount best for your soil needs--regardless of travel speed or whether the field is muddy, snowy, dry, hard or soft.

Remember, the Cobey Power-Driven Spreader gives you the best value--does the most for you! Fill out and return the coupon today--get a demonstration from your dealer.

THE PERFECTION STEEL BODY CO
Dept. FQ-10 Galion, Ohio, U.S.A.

THE PERFECTION STEEL BODY CO., Dept. FQ-10 Galion, Ohio, U. S. A.
☐Power Driven Spreader ☐31-A, Dump Wagon ☐11-A, Wagon Gear
☐21-A, Hi-Speed Wagon ☐2-Wheel Trailer ☐Utility Wagon Box
☐2-Wheel Tilting Platform Wagon

Name
Address
City
State

FARM BOOKS

Irrigated Soils *by W. W. Thorne and H. B. Peterson, The Blakiston Co., Philadelphia, Pa. $5.00*

Very shortly after the Utah pioneers became the first white men in America to use irrigation, they became aware that this practice carried with it a number of serious soil problems. One of these problems, the transporting and depositing of soluble alkaline salts, became so acute in several sections of the state that it caused the abandonment of irrigation and the beginning of dry farming.

It seems rather fitting that two Utah scientists, Thorne and Peterson, should produce this first book on the problems of fertility and management of irrigated soil. Though a large section of the 288 page book is taken up with actual methods of irrigating crops and the irrigation practices used with various crops throughout the world, the major part of the book deals with soil problems.

The technical language used by the authors makes for rather hard reading which is somewhat relieved by a liberal use of graphs, charts and photographs. For the layman, the going may be rough, but the information is there if he cares to dig.

Hunger Signs In Crops, *A Symposium —Published by: The American Society of Agronomy and The National Fertilizer Association. $4.50*

"I want to thank you all for bringing back into print *Hunger Signs In Crops,*" Louis Bromfield said recently in a speech before the convention of the National Fertilizer Association. "It is a book which in my opinion is about the finest in its field in the United States. It is a book which every farmer should have and every good farmer would have in his library. It is absolutely basic in relation to agriculture to prosperous agriculture and to good soil. I want to thank you for bringing it back into print. You are doing a great service to the American farmer on the whole."

This book, which Mr. Bromfield and others have praised so highly, was first conceived as a project of the American Society of Agronomy in 1936. The Plant-food Research Committee of the National Fertilizer Association joined the project and nineteen of the leading soil scientists of the country contributed their time and knowledge in preparing the text. The first edition of the book was published in 1941 and went through three printings before it was allowed to go out of print and this second edition prepared.

The basic idea behind the book is to

(Continued on page 141)

Surer Settling

Heifers settle more readily and drop sturdier calves when their feed is supplemented with B-F SuperSol. In addition to the high-protein, high-vitamin content, the valuable "unknowns" in B-F SuperSol, nutrition factors obviously present though unidentified, are especially beneficial to heifers in settling and calving.

●

Read for yourself a few of the replies received to a recent questionnaire.

QUESTION: Have your heifers fed SuperSol settled more readily?

Yes, 18 of the 20 heifers fed SuperSol settled in calf the first service against 14 of the 20 heifers that were the same age but were not fed any of the SuperSol.

Yes, we have noticed this in the increasing number of calves. We also noticed that the calves have more livability. They hold their flesh easier and longer.

In this short period I have noticed some improvement.

Since feeding SuperSol to heifers of breeding age and the brood cows, we have less cases of sterility. At present time ours is in the most productive stage in the last twelve years.

We have had very good success settling heifers since feeding Super Sol. Heifers that had not settled for a year are now settled

I have bred twenty females and have not had a return service - 5 heifers in this bunch.

Our FREE BOOKLET will tell you what SUPERSOL will do for your livestock — at a cost of only 2½c per head per day!

Write

FEED DIVISION
BROWN-FORMAN
DISTILLERS CORPORATION
at
LOUISVILLE IN KENTUCKY

(Available in pellet or granular form.)

PROVIDES

true VITAMIN A
VITAMIN D

B-GROUP VITAMINS
RIBOFLAVIN, THIAMIN
NIACIN, CHOLINE, PYRIDOXINE, PANTOTHENIC ACID,
p-AMINOBENZOIC ACID
BIOTIN, FOLIC ACID

FATS and PROTEINS
CALCIUM, PHOSPHOROUS
and ESSENTIAL TRACE MINERALS

plus **VITAL PRODUCTIVE FACTORS**

MINRALTONE HELPS BUILD CHAMPIONS

Douglaston Lady Augusta. Only cow of breed to be classified as Excellent and have four Excellent daughters. One granddaughter sold for $13,500 — a record price for a Guernsey bred heifer. Another brought $14,500 — highest auction price for a Guernsey in 1949. A great-granddaughter sold for $11,500, a record auction price for open heifers; and a half interest in a grandson netted $15,000.

Famous McDonald Farms Herd Protected Against

HIDDEN HUNGER*

The 1,500 acre McDonald Farms, Cortland, N.Y. has a wide reputation for the all-around excellence of its herd of purebred Guernseys, led by the great Guernsey champion, Douglaston Lady Augusta.

Mr. K. C. Sly, manager for J. M. McDonald, owner, has fed Hidden Hunger* fighting MinRaltone regularly since 1943. Mr. Sly says: "*As a safeguard for the health of the herd, we have fed Near's MinRaltone for the last seven years. We use a combination of all three recommended feeding methods — free access, premixing and hand feeding.*"

Now is the time to help safeguard *your* profits and the health and continued productivity of your stock. Follow the lead of successful dairymen — feed MinRaltone to your herd. MinRaltone protects against Hidden Hunger* because it contains 11 essential mineral elements with Vitamin D. Write for free MinRaltone feeding booklet and complete details.

NEAR'S FOOD CO., INC. • BINGHAMTON, N.Y.

*HIDDEN HUNGER — Lack of essential mineral elements needed by livestock for sturdy health, rapid growth, peak production and reproduction.

NEAR'S MINRALTONE

HEALTH - PRODUCTION - PROFITS

MULTIFLORA ROSES FOR FENCING AND HEDGES

500,000 Seedlings 1c to 6c according to size

Write now for planting and growing instructions—they sell out early

BROWNELL ROSES LITTLE COMPTON, RHODE ISLAND

The Dairy Barn

A BRIEF SUMMARY OF THE NEWEST DEVELOPMENTS IN DAIRYING AND THE CARE OF DAIRY CATTLE.

What Do Milk Veins Mean? Show ring judges and class room professors have long taught that the milk producing ability of a cow is related to the network of milk veins on her abdomen. It now appears that on this point, the judges and professors have been wrong. A recent experiment by the USDA brought out the fact that the surface veining has no more to do with a cow's worth at the milking machine than the handle on a pump has to do with the amount of water in the well.

When two dairy scientists, W. W. Swett, and C. A. Matthews, of the Bureau of Dairy Industry, delved into the subject they first compared the production records of 195 cows with their individual grades based on the veining on the cows' undersurface. They found that the two were not related, thereby upsetting the applecarts of a good many cow judges.

Carrying the investigation one step further, they dissected many cows for a close look at their circulatory systems. They wanted to learn a little more about how blood is circulated through the udder. Previous investigation found that 400 pounds of blood must pass through the udder for every pound of milk produced. This figures up to 20,000 pounds of blood daily for cows producing 50 pounds of milk. One of three internal veins was found to be large enough to carry this load of blood away from the udder, which is further evidence that the surface veining is not a good criterion for judging a cow's milk production possibilities.

Bloat Can Kill Cows In spring and early summer when pastures are being rotated and cows are getting an occasional change in green diet, the dairyman must keep a sharp eye for bloat, which can and often does kill expensive stock. Bloat is an abnormal collection of gasses in the cow's rumen. Bacterial action is probably responsible for gasses, and the action, in turn, may come from such causes as overeating, eating spoiled feeds, or blocking of the openings in the forestomachs with such undigestible items as hair balls.

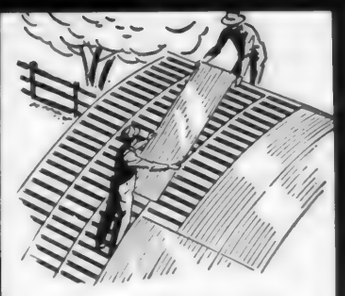
If the gasses continue to build up inside the cow she probably won't burst, but she may wish she would. The internal organs may be crowded so that heart action stops. The cow may also die if her tissues absorb toxic gasses from the rumen.

The best cure is prevention. When turning hungry cattle onto new or lush pas-

"ALCOA ALUMINUM ROOFING GIVES ME MORE PROTECTION AT LOWER COST"

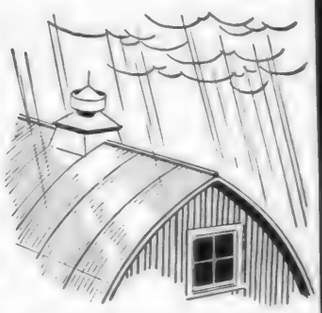
...usands of leading farmers in every part ...he country have told us that Alcoa Alumi- ...n Roofing makes the best roof they've ever ... on. Here's what they say, "Winter and ...mer it gives me more protection." "It's ... to put on." "It never needs painting." ... keeps buildings cooler."

Alcoa Aluminum Roofing has been tested and proved longer lasting. Roofs of Alcoa Aluminum put up over twenty years ago still are in excellent condition. For extra value, extra long life, use Alcoa Aluminum—the metal that lasts. Your dealer has it or can order it for you.



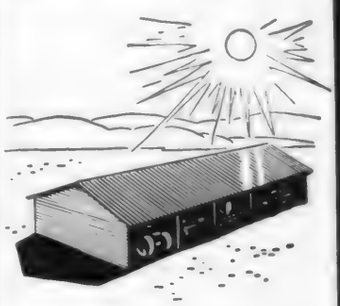
WEIGHT OR PROTECTION?

Alcoa Roofing is equal to 26 U.S. gaug... in thickness. Can't rust away, never need... painting, gives long life at low cos...



EXTRA STRENGTH - LONGER LIFE

Alcoa Aluminum Roofing is the stronges... gauge for gauge of any aluminum farm... roofing now on the market.



COOLER BUILDINGS

Farmers tell us, tests have proved, that buildings roofed with Alcoa Aluminum are up to 20° cooler on hot summer days.

WE SELL ALCOA ALUMINUM ROOFING

BUY WHERE YOU SEE THIS SIGN

Alcoa Roofing, corrugated and V-Crimp, is available everywhere from leading suppliers of building materials. Ask for Alcoa Aluminum Roofing.

• MAIL THIS COUPON TODAY

...LCOA ALUMINUM ROOFING SHEET

ALCOA ALUMINUM ®

ALUMINUM COMPANY OF AMERICA
1452C GULF BLDG., PITTSBURGH 19, PA.

Please send me the free booklets on Alcoa Aluminum Roofing and instructions for proper and easy application.

Name_____

Address_____

City (P.O.)_____ State_____

My building supply dealer is:_____

DETROIT PUBLIC LIBRARY

PATENTED

CORALOX

INSULATOR

Among modern farmers, *CORALOX* is rising swiftly in popularity, because it eliminates the principal causes of spark plug trouble.

Fouling at low engine speeds—misfiring under heavy loads—failure due to heat shock—accumulation of oxide coating—these are primarily *insulator* troubles.

CORALOX is AC's patented spark plug insulator. It has 4 times greater heat conductivity—10 times greater insulating value at high temperatures—than the best ceramic insulator material in use before *CORALOX*. It is 3 times as strong. It does not attract oxide coating.

You can see why AC Spark Plugs, with patented *CORALOX* Insulator, will give you easier starting—better idling—faithful firing under heavy loads—in your hard-worked tractor and other farm machines. Ask for, and install, AC Spark Plugs with patented *CORALOX* Insulator in your tractor, truck, and car engine.

AC SPARK PLUGS

AC OIL FILTERS

AC FUEL PUMPS

preferred on millions of vehicles

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

tures it is a good idea to feed them first on a good cured hay in order to leave them little room for gorging on fresh green plants. There is some evidence to support the old belief that dew dampened pastures are especially dangerous.

But, the cow which becomes bloated may still be saved. She can be punctured with a trocar which lets the gasses escape like a fast leak in a truck tire. In most cases, this is a job for a veterinarian, for an amateur jabbing a sharp tool around a cow's innards can do her as much harm as the bloat.

Apples Are Good Cow Feed Last year's big apple harvest set some research men at the Ohio Agricultural Experiment Station to thinking about the value of apples as cow feed. Every farmer knows that cows consider apples a delicacy. They know too that there is some danger of apples causing cows to go off their milk. What they haven't known is the actual feed value of the fruit. It was this latter point which the Ohio scientists investigated.

A laboratory test revealed that apples have a feeding value on a dry matter basis approximately equal to that of corn silage. Apples, however, contain about twice as much moisture as corn silage, so a ton of apples equals a half ton of silage. Cows at the Ohio Station ate about 30 pounds of apples a day after the fruit had been run through a root cutter. The belief among reasearch men is that the greatest value of feeding apples is as an appetizer or conditioner.

There is some basis for the belief that apples can do damage to milk cows. Usually the damage arises from overfeeding. This often occurs unavoidably when the cows break into the orchard and the farmer finds them only after they have gone over an apple tree and gorged themselves. Occasionally cows pass away from getting a whole apple lodged in their throats, but this shouldn't lead to condemnation of the fruit as a feed.

In summing up their findings the research men pointed out that in good apple years, when there is little market for the culls from the orchard, they may be chopped or sliced and profitably, in moderation, fed to the dairy herd.

Two Square Meals a Day Most dairy farmers feed their herds twice a day during the winter months. But a few have tried cutting down the chore time by feeding only once daily. Some farmers tried this short cut system during the grain shortage period in 1947-48. Others have tried it occasionally for its labor saving possibilities alone. Until recently, however, there had never been any scientific evidence to say one meal per day is better than two for a cow, or vice versa.

The USDA recently completed a checkup designed to learn the facts behind this controversy. Ten Holstein cows were divided into two groups of similar age, stage of lactation, and body weight. One group was fed once a day, and the companion group was fed twice a day. The cows followed this meal plan for 50 days. Then they traded places so that the once a day herd were fed twice a day and those that had formerly eaten twice a day were fed but once daily. At the end of another 50 days they were switched back to their original meal schedule. Three 50 day periods completed the experiment. The production records, body condition, and feed consumption were checked carefully. When the results were studied the research men learned that twice a day feeding of dairy herds nets the farmer around six cents a cow more daily than feeding only once daily.

The cows fed twice a day ate 10 per cent more alfalfa, produced six per cent more milk, and required 70 per cent more labor. Translated into money terms, this experiment showed that, at least theoretically, a 20 cow herd would return a net income above cost of feed and labor of $29.51 daily if fed two meals a day. Fed once a day they made $28.37. The difference is slight, but still in favor of feeding twice a day. Not many dairymen will have to change their feeding plans in the light of this experiment, but most of them will know that they have been on the right track all along.

Here's how to buy a Tractor

1 Have your Massey-Harris dealer explain the many advantages of owning a Massey-Harris Tractor to you — its power . . . economy of operation . . . modern design . . . clean lines, good vision . . . ease of handling . . . and the well designed tools to go with it. Notice how perfectly your own ideas of a tractor match what Massey-Harris gives you.

2 Take a Massey-Harris out to the field. Put it through your own tests. See how smoothly it rides . . . how easily it steers. Notice the smooth, steady roar of the powerful Massey-Harris Engine. Watch it settle down to the job with the smooth, steady power that gets things done. Available in six sizes, there's a size and model for your farm.

3 Talk to your neighbors who own Massey-Harris Tractors. Out of their own experience they'll tell you about the Massey-Harris' rugged construction, long life, dependable performance, low fuel consumption. They'll confirm your own opinion that Massey-Harris Tractors help you farm easier, faster, more profitably.

4 Take these 3 steps and you'll understand why Massey-Harris Tractors like to be compared. And as you use your new Massey-Harris, you'll realize why more and more farmers are saying "Make it a Massey-Harris." So take the first step now and see your Massey-Harris Dealer. For more complete information about Massey-Harris Tractors and Equipment by mail, use the coupon below.

Make it a Massey-Harris

1-Plow "Pony" 2-Plow "22" 2-3-Plow "30" 3-Plow "44-6" 3-4-Plow "44" 4-5-Plow "55"

THE MASSEY-HARRIS COMPANY
Dept. C-222, Quality Avenue, Racine, Wisconsin

Please send me a FREE folder on Massey-Harris Tractors and Equipment.

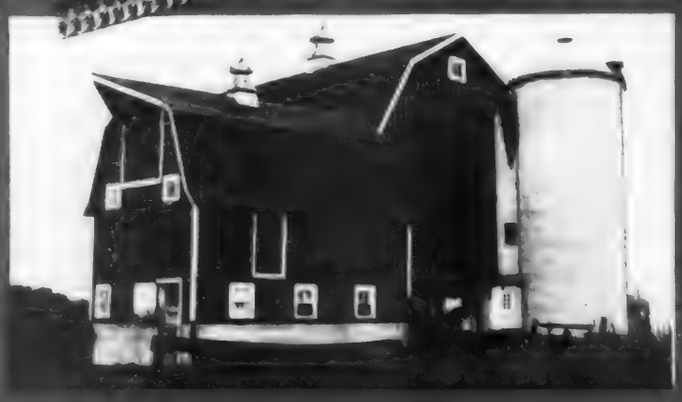
Name ..... (Please Print)

Town ..... RFD .....

County ..... State .....

"The best treatment for mastitis* I've ever used!"

SAYS E. J. LUBECK
OF MILTON JUNCTION, WISCONSIN



"I keep it right in the barn..."

"..where I can get it quickly.."

"...and use it to treat mastitis in a few seconds"

"We spent a lot of money trying to keep mastitis out of our herd of 27 Holsteins. We tried most of the mastitis treatments and nothing seemed to work.

"Then I read about Squibb's Penicillin Ointment in Hoard's Dairyman. I went to my druggist, bought my first tube and used it. *I have not been without it since.*

"This Penicillin Ointment is the best treatment I've ever used. It has given us remarkable results and saved us real money. Now we expect to continue getting full production of milk and cream from clean, healthy cows.

"We especially like the shape and style of the tube. It is fine. Cows do not seem to object and the thin taper makes it mighty easy to insert in the quarter. The ointment comes out easily, too, so it only takes a few seconds to treat a quarter.

"Whenever there is the least sign of mastitis in our herd, we treat the cow then and there, as we keep Penicillin tubes in the barn all the time."

• • •

It's a good idea to do what Mr. Lubeck does: keep some Squibb Instant-use Penicillin *on hand* right in the barn, and treat mastitis early—as soon as it shows up.

Why not get a dozen tubes the next time you're in your drug store? They have it or can get it for you.

For accurate diagnosis of mastitis, consult your veterinarian.

For SCOURS in calves and other young animals—**PENOVOXIL CAPSULES.** A specially prepared, exclusive Squibb formula—only product of its kind on market. Effective—easy to use—no drenches—no injections. If your druggist isn't supplied, write to E. R. Squibb & Sons, Veterinary and Animal Feeding Products Division, Dept. FQ-10, 745 Fifth Avenue, New York. Literature on Penovoxil Capsules, Penicillin Ointment, and other Squibb specialties, available on request. Just drop us a postcard for yours.

*Due to *Streptococcus agalactiae*, the cause of the largest percentage of all mastitis cases.

SQUIBB – A NAME YOU CAN TRUST

easy THRESHES IT

Rubbed in the palm of your hand, grain or seed shells out of the head easily when it's ready for harvest.

Rubber-against-rubber shelling contacts in the ALL-CROP Harvester give that natural rubbing action, the most effective threshing principle known.

The crop falls on a wide rubberized draper and rides straight to the full-width, spiral-bar cylinder in a thin stream, just as it grew in the field. Rubber-cushioned cylinder bars rub out the seeds against rubber concaves.

Then comes the second unique step in ALL-CROP Harvesting. Tossed in a high arc, straw is floated free from kernels by Air Blast Separation; is left long and fluffy for livestock bedding. It's easy work for the oversize straw rack and cleaning shoe from there on. They save more grain and clean it better.

That same handling of over 100 grains, beans and soil-building seed crops makes the ALL-CROP what it is . . . truly an *ALL-CROP* Harvester.

THE
ALL-CROP
Harvester
Now Has Optional
HYDRAULIC Header Lift*

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

* *Plus 17 other new features and advantages.*
Ask your Allis-Chalmers dealer about them.

★ THE LAW ★

Using the price support law is as simple as this: call the PMA (usually known as the AAA) County Chairman to inspect your grain and storage. If they pass, you get a check for a loan and turn the grain in later as payment. Or you can sign a purchase agreement to insure yourself of government prices later. Prices are based on parity, usually higher than market prices.

How to Benefit from Price Supports

BY GRANT CANNON

EARLY last fall the Clermont County Sun published a display ad which opened with the scarehead: "MR. FARMER — Sell your corn to the government for $1.48; store it right on your farm; then buy your corn to feed for 65c . . ." The ad promoted the sale of corn bins, crop dryers and shellers. Many farmers asked themselves, "Can I really get away with that? Is it right for me to do it? What is the law?"

To get to the answers to these questions it might be well first to go over some of the background of the present price support law. This may be a little like putting the bitter part of the pill around the candy coating, but to understand how the law works, the reader should know what the law is.

The Pill

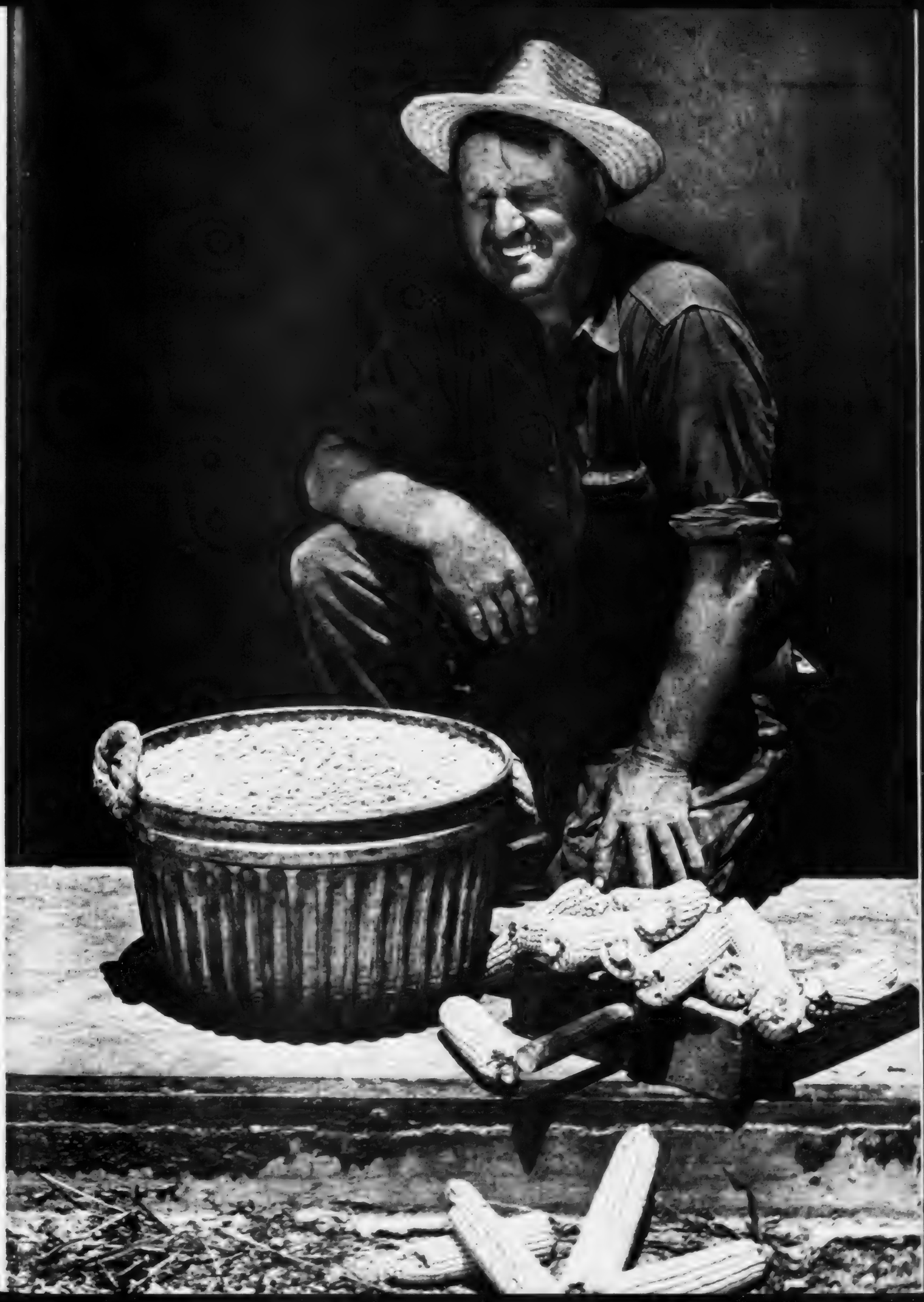
The Agricultural Act of 1949 did not radically change the existing price support legislation, but it did assure prices on a higher level than would have been true under the 1948 law. Its main effect was to make certain amendments to a body of law that has been built up over the past 15 years.

In discussing the purpose of any type of price support, Secretary of Agriculture, Charles F. Brannan, said "As an isolated individual, the farmer has no control over the prices he will receive, and no adequate way of adjusting the total market volume of his commodities to changing demand. On many occasions in the past he has labored all season and produced a good crop only to find that, because of circumstances beyond his control, his labor would go uncompensated and sometimes his cash investment in seed, fertilizer and other operating costs would be only partially recovered. A program to help him meet those basic difficulties is the very minimum for which we should strive."

There are those who sharply disagree with this philosophy and feel that government should not interfere with the normal operation of the national economy. The majority of both major political parties, however, seem committed to price support legislation.

This effort to tailor the supply to fit the demand and to keep agricultural prices high has a long history with American farmers. Still fresh in the minds of Kentuckians are the efforts of the rough and ready tobacco growers who, shortly after the turn of the century, banded together into what was called the Equity Pool to hold down production and force a price increase. The decisions of the pool on acreage allotments were enforced in a singularly direct manner by night riders who swooped down on the farms of non-cooperators, burned their barns, salted the fields and tore up the growing beds. Some men who lived through this period say that most of the violence came from the settling of neighborhood grudges under the guise of pool activity, but whether the pool was responsible or not, the violence brought about

STORAGE BINS have been hastily erected in all parts of the country to handle bumper crops. Present overproduction might swamp the price support program.



WITH ACREAGE ALLOTMENTS imposed on his wheat, the careful farmer harvests every head of grain by opening the field with a mower before the combine starts rolling.

a reaction which ended this crop control effort. The citrus fruit growers and milk producers have also attempted to curtail supply by dumping their produce instead of marketing it. In 1929, the Federal Farm Board was organized and attempted to bolster wheat and cotton prices by heavy buying without the authority to cut down on supply. The result was an expansion of acreage to take advantage of a good thing and the program collapsed under the surplus.

With these experiences behind them Congress passed the Agricultural Adjustment Act of 1933. The Act was designed to hit the problem from two angles by (1) controlling production and (2) bolstering prices by government purchase and payments to the farmers. Since the program was put into effect in midseason the acreage control consisted of plowing under the excess crop—an act that has remained a political symbol ever since. When the original AAA was declared unconstitutional because of its taxing features, many of its objectives were salvaged and were finally incorporated into the Agricultural Adjustment Act of 1938 which, with amendments from time to time, has remained the basic law on this program.

The Law Today

The Act and its amendments charges the Secretary of Agriculture with the responsibility of keeping the production of certain crops in line with the demand for them. The Act authorizes the Commodity Credit Corporation to make loans and purchases of these crops to keep agricultural income and purchasing power in line with that of the rest of the nation.

To control the supply of basic commodities the Secretary of Agriculture is authorized to use two general devices, acreage allotments and marketing quotas. When the supply exceeds the demand, the Secretary estimates the number of acres of a given crop it will take to meet the normal consumption for the coming year. He then proclaims a national acreage allotment that is large enough to fill this need and provide a safe margin for carryover. This allotment is then broken down to give each state that produces the crop its share of the allotment. The state allotments are further broken down into allotments for producing counties, still further for each community within the county and, finally, for each farm within the community. The acreage allotments are not mandatory for the farmer; the pressure the government uses to induce the farmer to cooperate is like the carrot that is tied on a stick in front of a mule to get him to go and fed to him as a reward at the day's end. If the farmer cooperates he is eligible for the full government support loans and purchase agreements on that crop.

Marketing Quota

The marketing quota is a different animal; it has teeth and can bite. A marketing quota restricts the farmer to selling or consuming on his own farm only the amount of a crop that can be raised on his acreage allotment. At harvest time, when the marketing year begins for any crop, the Secretary of Agriculture is obliged to estimate the total supply and determine whether it exceeds the normal demand by an amount that would warrant imposing marketing quotas on the following year's harvest. Congress has fixed these excess amounts for the basic crops as 10 per cent above estimated needs for corn, 30 per cent for wheat, 10 per cent for rice, and so on.

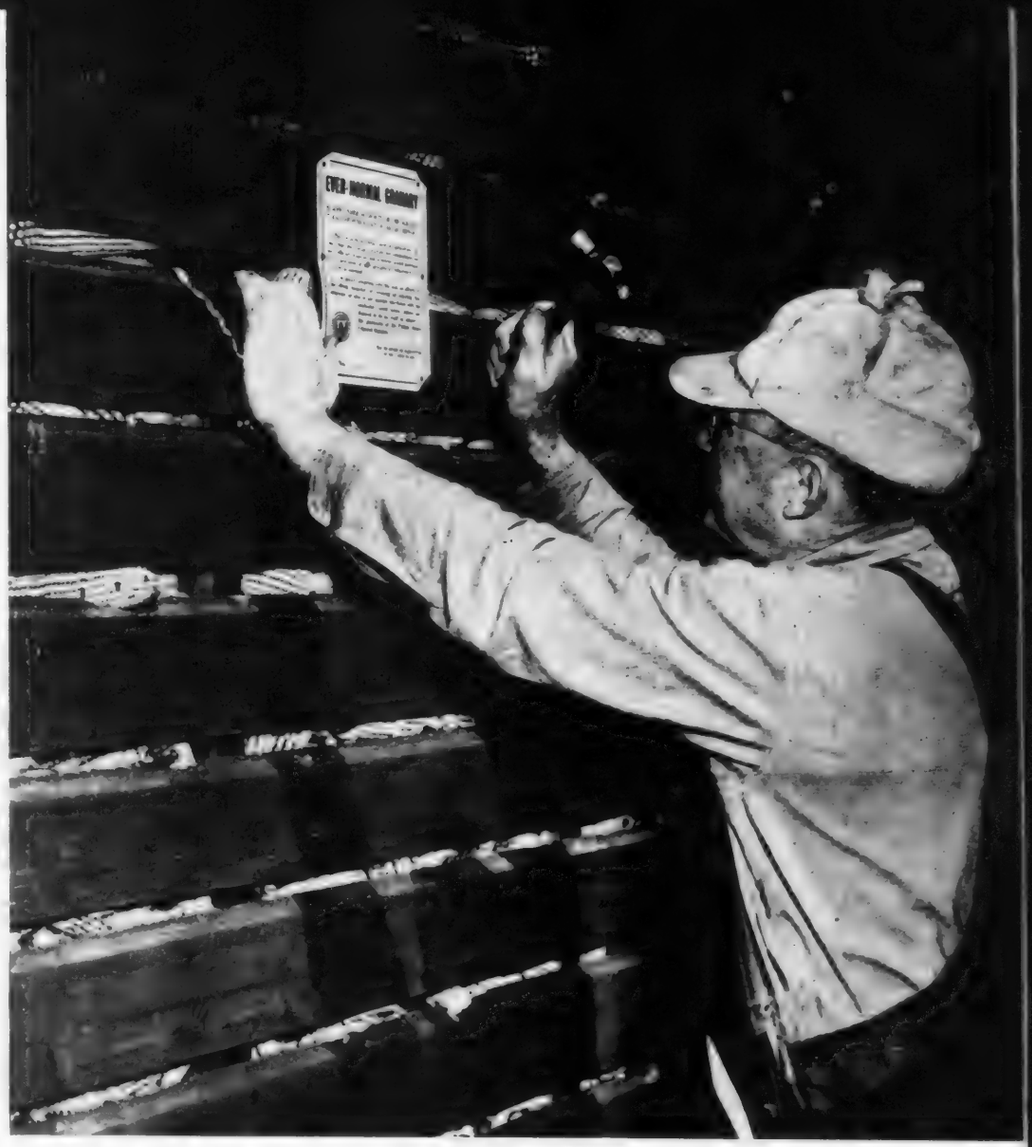
When the Secretary of Agriculture proclaims a marketing quota, the farmers involved are notified and informed of the acreage restriction that will affect their particular farm by the County Production and Marketing Administration Committee. They are then given an opportunity to vote on whether or not they wish to have the marketing quota invoked. If two-thirds of the farmers vote in favor of the quota, it goes into effect and applies to all farmers raising the crop. Such quotas have been in effect for tobacco growers for many years and this year the growers voted to extend the quotas for another three years. Their vote in this election, as in the others, showed that over 90 per cent favored the quotas. If they had rejected the quotas they would have forfeited all right to price support. With growers of other crops, a rejection of a marketing quota means they will suffer a substantial cut in the support price.

When a marketing quota is in effect the grower *must* stay within his acreage allotment or face a penalty. The penalty for

exceeding the acreage allotment for cotton or rice is a cash payment of 50 per cent of the parity value of the excess that was grown; for wheat, corn and peanuts, it is 50 per cent of the support price; and for tobacco it is 40 per cent of the previous season's average price per pound. Alternatives to paying this cash penalty—except in the case of cotton—are to give the excess crop to the government or to put it in sealed storage, plant a correspondingly smaller crop the next year, and market it with the next year's crop. Cotton growers must pay the penalty before they can market any of their crop penalty-free. If a buyer accepts any of a quota crop without a marketing card, he must pay the penalty.

These devices for holding the supply to demand levels will naturally tend to keep the price from dropping drastically. Congress, however, has devised other means which are used to insure the maintenance of prices. For the crops which Congress has listed as basic agricultural commodities, corn, cotton, wheat, rice, tobacco, and peanuts, it has voted mandatory price supports. In cases where producers have not voted down marketing quotas, the price support for cooperators is 90 per cent of parity for 1950; in 1951, between 90 per cent of parity and a minimum which can range from 80 to 90 per cent (the exact minimum being determined on a sliding scale based on total supply as against normal supply); and between 75 and 90 per cent in 1952, with the minimum percentage again based on the sliding scale. If marketing quotas have been proposed and voted down, the price support drops to 50 per cent of parity on all these basic crops except tobacco. If the tobacco growers vote down marketing quotas *all* price support is withdrawn.

In addition to the six basic crops, Congress also made it mandatory for price support for wool (including mohair); tung nuts; honey; early, intermediate and late Irish potatoes; milk; butterfat; and the products of milk and butterfat. Except for the dairy products, these non-basic items are supported at between 60 and 90 per cent of parity. Milk, butterfat and the by-products are to be supported at from 75 to 90 per cent of parity.



SEALING THE BIN after a government loan has been made on the corn is done by tacking a federal sign to the side. The farmer is responsible for delivery of both the amount and condition of grain, which is collateral for the support loan.

NO LOAN would be made on corn stored this way, but the farmer can feed this corn and get a loan on his crib-stored grain.

Among this group of commodities are some that are given price support in order to encourage their production, wool and mohair for example, or tung nuts. "It may seem odd to find us supporting the price of tung nuts," Senator Clinton Anderson, who is one of the authors of the 1949 law, said, "when we only have a handful of tung trees growing in this country. But during the war, when we were cut off from our normal supply from China, we were pretty near desperate for tung nuts. Tung oil can be replaced by other oils for some uses, but there are certain military uses for the oil for which there is no substitute. I ran into this situation when I was serving as Secretary of Agriculture, so I included price supports for this crop to encourage its production and keep us from getting into another such situation."

Congress permits price supports for other agricultural products when the Secretary of Agriculture feels that there is a need for this. The Secretary is guided in making such a decision by the supply and price of the crop; by the amount of money he has available for this program; the importance of the commodity to the national economy; the perishability of the commodity and the ability of the government to dispose of it if they take it over; and the ability and willingness of producers to keep supply in line with demand. So far as is possible the Secretary is directed to support the prices of the storable commodities in this group at between 75 and 90 per cent of parity.

How the Law Works

During the past several years there has been no acreage allotment on corn and farmers were permitted to grow as much as they pleased. As this article is being written it seems likely that one will be declared for the coming crop season. When harvest time comes any farmer has three choices open to him for disposing of any corn he does not intend to feed: (1) a government loan, (2) a govern-

ment purchase agreement, or (3) selling on the open market. One factor which will influence his choice is whether or not he lives in a commercial corn producing county. In such a county the price of his corn is supported at 90 per cent of parity whereas the price support in non-commercial counties is 67½ per cent, which is lower than he could probably get on the open market. To be declared a commercial corn county it must be shown that for the preceding ten years the farmers in the county have averaged four bushels of corn for every acre of farm land in the county and also averaged 450 bushels for each farm. Each year the Secretary of Agriculture is directed to check to make sure that any county which can qualify is listed as a commercial producing area and to exclude any which have not continued in that status.

In 1948, Ralph Green, who operates a 320-acre farm in Jefferson County, Ind., harvested a bumper corn crop. Normally he feeds all of his corn, but with the big crop he had a surplus. Since Jefferson County is a commercial corn producing county, he decided to take advantage of price support on his excess crop. He cribbed his excess corn in a separate bin and telephoned Stanley Demaree, chairman of the County Committee, to find out how he could get the most for it. "You can either take out a loan on the corn or take out a purchase agreement," Demaree told him, "and get about the same amount for it in the end. If you want your money right away you should take out a loan. If you don't mind waiting for your money you can take out a purchase agreement. It will cost you a cent a bushel service fee to get a loan and a half cent a bushel for a purchase agreement."

Green decided that he would prefer to take out the loan and made an appointment for Demaree to come to the farm, inspect the crib, and take a sample of the corn. The following day Demaree checked over the crib to see that it had a good floor and roof; that it was sufficiently reinforced to hold grain safely; that it wasn't on ground subject to flooding; and that it was away from fire hazards. As he put it, "The real test is: Will the corn keep?" Having assured himself that the crib was in good shape, Demaree measured it to determine the number of bushels it contained and to see that the grain wasn't piled too thickly in any one dimension (in Jefferson County corn of less than 18 per cent moisture can be piled up to 10 feet). He then removed a slat from the side of the crib and ran a probe into the center of the stored corn to get a sample. Both Green and Demaree are too old in the farming game not to know good corn when they see it, but this is part of the procedure.

Four days later, when the state office had returned the corn sample with its grade and moisture content, Green came in to Madison, the County seat, to fill out the papers and get his loan. By this time Demaree had prepared a file for Green containing the inspector's work sheet, which he had filled out on the farm. This included the grade and moisture content which he had received from the state office in Indianapolis. Green's corn graded No. 3 and had a moisture content of 18 per cent. Under the law, it must grade No. 3 or better, or No. 4 because of test weight only, and must have less than 20.5 per cent moisture. If the loan is made after the first of April the moisture limit drops to 17.5 per cent. Shelled corn must have a moisture content of 13.5 per cent or lower to qualify for a loan.

The inspector's work sheet showed that Demaree had figured that at 2.5 cubic feet per bushel the bin contained 961.16 bushels. When he deducted the six per cent excess moisture he reduced this figure to 904 bushels. A commodity chattel mortgage and a producer's note were filled out listing the corn as collateral security. Green signed both documents and took them to the First National Bank and was given $1,319.84, which was $1.47, the support price, less a cent a bushel service charge on his 904 bushels. The crib of corn was then "sealed," which consisted in tacking a government card on the side, and Green was told that he was responsible for the corn until September when he would be notified when he should deliver it.

"A neighbor of mine," Green says, "told me that I was a fool not to put all my corn under loan and buy the corn I needed to feed. I asked Demaree about this and he told me that I would be within my legal and moral rights to do this. By keeping all of my own corn off the market and buying corn I would be building up the price, which was just what the whole program was designed to do. The thing I *couldn't* do, he told me, was to buy corn on the market and put it under loan, but as long as I raised it I could get a loan on every bit of it. Trouble was that I didn't have enough storage space to put all my corn on loan and still have room to store bought corn for feeding."

From the time the bin was sealed until September 12, 1949, when he delivered the grain, Green was responsible for its safe keeping. If rats had ruined part of it or the roof leaked and it spoiled, if the crib broke down or weevils got in, he would have had to pay for the damage. If something entirely beyond his control had oc-

DAMAGE TO GRAIN in a sealed granary is charged against the farmer unless caused by an Act of God. This bin was on normally safe ground and the government stood the loss.

FARMERS VOTE on marketing quotas. These tobacco farmers have the secret ballot explained to them as they and other growers elected to accept quotas for three years. A vote against quotas would have canceled price supports from the crop.

curred, like a flood, when the crib was on ground considered safe, or lightning, or a hurricane, the Government would have been the loser. If Green had wanted to sell the corn during the loan period he could have paid off the loan and sold the corn, but he would have had to pay three per cent interest on the loan in this case. If he had discovered that weevils were infesting the bin or that the corn was going out of condition for some other reason, he could have arranged for an earlier delivery date in order to save it.

On September 12 and 13 Green delivered (at his own cost) five truck loads of grain. At the terminal a federal grain grader checked each load and gave him a No. 1 grade on one load, No. 2 on three loads, and No. 3 on one load. The load that graded No. 3 and one of the No. 2 loads were found to be weevily and he was docked a half cent a bushel on them. On the load grading No. 1 he was paid a cent premium, and a half cent premium was paid on the two weevil-free loads that graded No. 2. In measuring the grain it was found that he delivered 909.11 bushels, so a check for $10.65 was made out to him which paid him for the five and a fraction extra bushels and for the premium on his top grade corn. A settlement form was then filled out, the mortgage and note canceled, and the file was closed. When the loan is closed out by delivery of the grain, no interest is charged on the loan.

"Most cases don't settle out quite as close as this one," Demaree says," "since we usually over- or under-estimate the corn by more than five bushels. If we over-estimate the crib the farmer has to make up the difference when he makes delivery and we pay off when we under-estimate. One fellow had to make up a difference of 400 bushels, but in that case I happen to know that he slipped some corn out of the crib for feeding."

If Green had elected to take a purchase agreement on the corn instead of the loan, the procedure would have been quite different. He would have gone to the county PMA Committee office (which, in most places, is still known as the AAA Committee) and arranged for a purchase agreement for the corn. This simply means that the Government agrees to buy a certain amount of corn at support price on the delivery date which is usually September 1 following harvest. Green would have had to pay a half cent a bushel service charge for this agreement, but there would have been no inspection of his corn or the storage facilities. If he wished to feed this corn or if he found a market for it that was to his advantage he could sell the entire amount or any part of it. In other words, a purchase agreement assures him of the support price for any amount of his corn up to the amount he specified when the agreement was made. He cannot deliver more than that amount and the corn he delivers must be a No. 3

(Continued on page 113)

The biggest PLOW in the World

BY ARCHER P. WHALLON

When a farm wears out in California, big plows are used to turn up another. They range from four-foot jobs (left) to six footers shown on the opposite page.

OUT in California they have a plow that turns a furrow six feet deep and thirty inches wide. They say it's the biggest damn plow in the world, bigger than anything Florida ever dreamed of, bigger even than Paul Bunyan's plow.

It is not a practical joke, and the Californians didn't make it so that they could brag about the biggest of everything. It has its use, and a very practical use it has. It is used to turn up the subsoil. Sometimes winds or flood waters bury the soil under several feet of silt and sand; sometimes the top soil becomes worn out and can be renewed by bringing the fresh, virgin lower strata to the top; sometimes, in a very sandy soil, plant nutrients leach down through the sand and must be turned back to the top periodically; tough adobe soil is sometimes turned under and a more workable soil is brought to the surface.

Apparently, all these things happen to soils only in California, and perhaps to a limited extent in neighboring states.

At least, the biggest plow in the world is a California job. It was made and used by the Post Brothers of Santa Ana. It is essentially a moldboard plow of the same basic design as that of the common 12 and 16 inch plows with which all farmers are familiar. There the resemblance ends. Whereas the puny 12 to 16 inch farm plows are powered by a team or a small tractor, the Big Plow requires four or five big tracklayer tractors, with a combined horsepower of about 500, to move it. It is 35 feet long, 11 feet wide, 10 feet high and weighs seven and a fourth tons. It is lifted and controlled hydraulically.

The Post Brothers make several types of big plows, ranging from the big six-foot job to smaller ones which plow furrows two, three and four feet in depth. They sell them or rent them.

While California owns all the big plows in this country, there are several regions of the world where plowing to a depth of two to four feet is fairly common practice. Foreign giants date back more than fifty years to the era of the horse and the oxen. The famous French "Bajac" plow, made for use in North Africa, was a reversible one-way plow with both right and left hand bottoms. The idle bottom, when lifted, was held in the air higher than a man's head. It was pulled by forty oxen, and left the ground level without dead or back furrows. Other big plows have been used in Germany, Great Britain and France.

A distinction should be made between the true "big plow," an implement which turns a furrow, and those tools which penetrate only. These are the land chisels, mole or gopher drainage plows, and subsoilers now in universal use. They make subsurface drainage channels, break up the hard pan and plow sole, and are sometimes used for deep drilling of fertilizer. They penetrate up to six feet.

The term "big plow" is sometimes applied to big gang-plows, assemblies of multiple 14 to 16 inch plow bottoms. An exhibition model of this type, made about 25 years ago, was made up of 60 plow bottoms, pulled by three big tractors, and turned oven an acre in less than four minutes. It was, at the time, called "the world's biggest plow." But a big gang plow and a big single furrow turning plow are quite different implements, although there are three-bottom gang plows that turn furrows nearly three feet deep.

Another variation of deep tillage is "double plowing" or subsoiling with an implement in which one plow bottom is placed above the other, or those with reversible right and left plows, with which a return furrow is made in the bottom of the furrow turned at the first passage. Some very heavy deep tillage implements of these types have been made and some have been used in plowing sugar plantation land in California and in Hawaii. Double subsoil plows of this design have long been used in Europe, and a lighter plow of the same basic design is now advertised in the United States.

About twenty years ago a double disc plow, with one disc placed above the other, the Sullivan deep tiller, was manufactured in Michigan. It was an excellent implement for making a deep mixture of top-soil and subsoil, but it did not attain any considerable use because of the lack of an adequate motive power at that time.

A six-foot plow designed for use in a peat utilization project in Scotland, and a submarine implement for plowing harbor bottoms, built very much like a moldboard plow but of even larger dimensions, are now in use. But for strictly agricultural purposes, the Californian Big Plow seems to hold the record for size.

THIS GIANT could turn an average Midwest farm bottoms-up in a few hours — only on the vast stretches of the West is it useful. It turns up hardpan six feet deep and requires three tractors or an equivalent of 500 horse power to move it through the earth.

The Reluctant MULE

BY. J. A. BURKHART

The Missouri mule is passing into legend, albeit as reluctantly as he works. A gallant pioneer on American farms, the tractor has done him in.

TOLL the funeral bell, chant the dirge, shed the furtive tear; for the mule, with ears flapping and hard tail swinging, is walking into limbo. He'll be a mule to the last; he won't walk fast and he'll balk a time or two but he'll get there, nevertheless.

He joins in oblivion the threshing dinner and the outside privy in that procession of pioneer virtues that made young America strong and great.

This honest, homely workman is a victim of progress. Our grandchildren will probably know him only as the strange looking inhabitant of a pen at the zoo. History will probably not do him justice, for his reputation among those who know him only by hearsay is not pretty. To the layman he has the soul of Beelzebub, the disposition of a mother-in-law with the toothache, and he can't be trusted; but to a Missouri mule skinner the mule is the noblest of all God's creatures.

The mule has enriched the American language; no animal has inspired so much profanity, so much concentrated vituperation. Either you laugh at a mule, or you swear at him. No poet has sung his fame, and few painters have cared for his unhandsome profile. He is purely a utilitarian beast, a creation of man when he diverted one of nature's laws to cross two noble creatures, the horse and the ass, to make a hybrid.

Even Missouri Was Wrong

Twenty-five years ago a Buchanan County, Missouri, farmer went on record as saying, "The day will never come when Missouri farmers can get along with less than four mules; the Missouri mule is here to stay."

Today, the mule prophets of yesterday are without honor even in their own state.

The tractor has put the mule out of business. As a result, Missouri mule barns stand untenanted, auction yards are quiet, county assessment rolls are empty, and the demand for Missouri mules, once insatiable, is now reserved for "killers" and "showers." Only the rendering plants and the show rings welcome the Missouri mule.

Unjust as the legacy of the Missouri mule may seem, there are those who say he is only getting his just deserts. The mule has had a bad reputation throughout history. The Spanish say, "He who wants a mule without fault must walk," and the French add, "The mule keeps a bite in reserve for his master." Even among Missourians, the people who know him best, he has a reputation for his eccentricities, waywardness, and unpredictability. Missouri folklore swells at the seams with homely wisdom about the mule. "Never bet on what a man can do, or what a mule will do," and "The best way to put a mule in his stall is to hire someone else to do it." Many years ago a nameless Negro said, "The Missouri mule don't kick according to no rule." The saying is still remembered while the unappreciated animal's virtues are as unsung as his passing. Roget's *Thesaurus* gives "obstinate person" as a synonym for "mule."

The story of the Missouri mule is a story with a kick in it. A Missouri outlaw mule could knock a hole in a two-foot wall, stand on his head and kick at the sky, and chill the spine of the toughest mule skinner with his display of temperament. The large barns, which mule barons built to house the animals until they were sold, had windows the size of a ray of sunlight. Stockmen felt that the Missouri mule was less lethal in a dimly lit enclosure than in a well lighted one. And Missouri mule buyers, out of respect, quickly learned to take the shoes off the hind feet of those which they purchased. A barefooted mule could kick just as hard as a mule with shoes on, but even a glancing swipe from a shod mule was dangerous. To this very day, the railroads refuse to carry a Missouri mule with shoes.

The first mule to set foot on the soil of Missouri came into the state from Mexico. However, the Mexican mule, originally from Spain, proved inadequate for the hard, endless labor of the American frontier, and the now famous Missouri mule was invented. Kentuckians sent blooded jacks and jennets into the State, and Ohio farmers sent large, strong mares. After the mule colt was foaled, high grass, limestone springs, and the expert handling of Missouri farmers did the rest. The result was a large-boned, shambling animal, weighing between 1,100 and 1,200 pounds, an animal which did not have a peer anywhere.

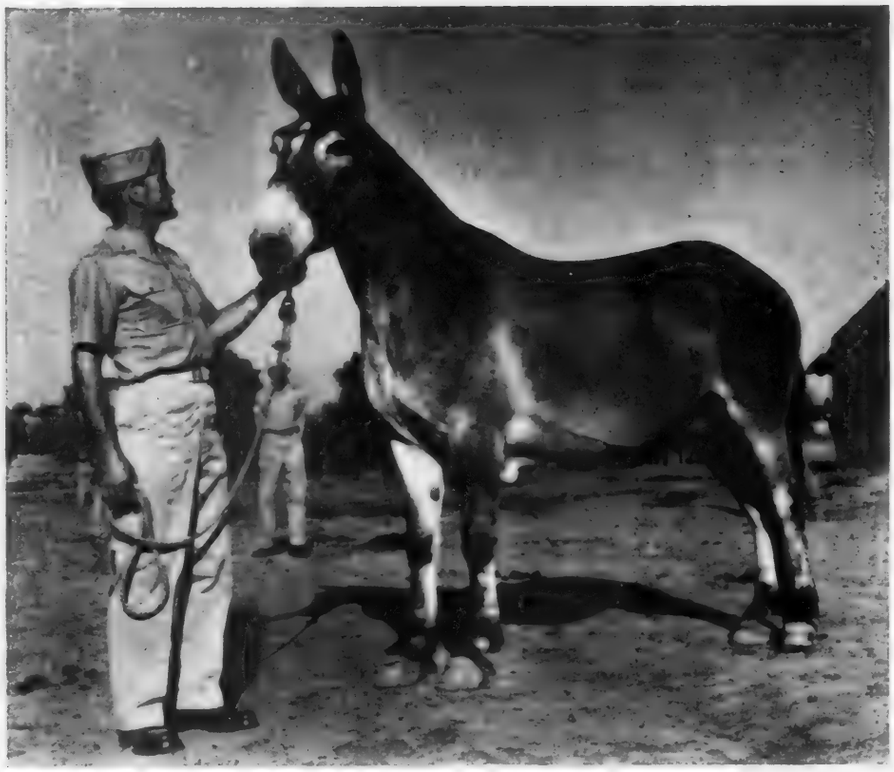
Although the mule industry in Missouri had an early beginning, it was not until after the Civil War that the state achieved unquestioned supremacy in both the quality and the quantity of its mules. The depressed condition of Southern economy after the war prevented the states, which would have logically challenged Missouri, from competing with her. Good mules and good horses are seldom found in the wake of armies, and the South in 1870 was no exception. A vacuum existed in mule raising and Missouri quickly took steps to fill the void. In 1870 Missouri stood seventh among the states in mule population; in 1880 the state stood first.

THE MULE COLT is cute, but he grows up to be a plain animal as unlovely as his voice.

THE MULE came to full flower and glory in Missouri, whose new capitol forms a backdrop for this sad member of a vanishing race. Piddling jobs such as this are his present lot.

Qualitatively, Missouri mules also created a class for themselves. They were singled out for national recognition at the Chicago International Fair in 1893, and at the St. Louis World's Fair in 1904. At the St. Louis Fair one Missouri mule raiser, William Elgin, won so many prizes with his mules that when the checks began to arrive he thought a mistake had been made and actually sent back some of the prize money. He won $5,000 with six mules, a record without precedent. Other Missouri mulemen supplemented Elgin's showing and by the time the Fair was over, mule buyers from all over the world were talking about the Missouri mule in terms of admiration and esteem. The State's reputation justified a picture which frequently appeared at this time. Below an illustration of two mules being led by their halters was the caption, "In mules Missouri stands at the head — the only safe place."

Actually, this advice was more apparent than true. Jake Fess, who has worked around the horse and mule commission barns in Kansas City, Missouri, for twenty-five years, claims he received his hardest mule kick while standing by a mule's head.



THE MULE has been an unsung and undecorated hero of all our modern wars. This fine jack is one of the few the U. S. Army still owns; the army is going out of the business.

THE LAST STAND of the mule is the cotton patches of the South. He is the only draft animal which could survive under the subsistence conditions of the share-cropper.

The mule cow-kicked him with its hind foot, breaking his thumb, fracturing several ribs, and narrowly missed his face.

The growth and expansion of America during the latter part of the Nineteenth Century can be told, in part, in terms of mule statistics. There were mules for almost every purpose; sugar mules, cotton mules, tobacco mules, banana mules, logging mules, draft mules, levee mules, Pennsylvania miners, and advertisers. There was even a class called potato mules, animals which were sent to the potato fields of Maine.

They built the railroads, logged the forests, plowed the fields and harvested the wheat. Teams of eight, twelve, and sixteen, powered the reapers and the combines. They turned the grist mills, built the roadways, forced the sugar out of the sugar cane. They groaned and sweated and kicked—but they did not stop. The coal mines employed them, the army utilized them, and foreign countries purchased them.

The penetration of American democracy into distant cultures was often accompanied by the adaptable mule, an able representative, having all the flavor and tang of Missouri individualism. He was sent to South Africa and the West Indies, to Cuba and Central America, and even to Siberia.

During the Boer War, the British government purchased 55,061 mules in Missouri,

ONE OF THE RAREST of nature's whims—a colt dropped by a mare mule. The colt, sired by a stallion, was born in St. Martinsville, La., Nov. 13, 1947. The attending vet, who also took this snap, was Dr. George Broussard, of New Iberia. Lou was 12 years old and pulled a cane wagon all day on Nov. 12. She was owned by Acie Miller, a St. Martinsville mule trader.

and the Boers continued to buy and to use mules from Missouri long after the war was over. In the Russo-Japanese War, both Russia and Japan sent agents to Missouri to purchase mules for military use.

On one of his journeys the mule achieved a touch of the exotic in far-off Arabia, land of mystery and intrigue. Colonel Lawrence tells of his secret conference with King Hussein of Arabia during the peace negotiations which followed World War 1. The setting for their meetings had all of the atmosphere of a tale from the Arabian Nights. Under the cover of darkness, the King rode out of Mecca for their rendezvous. No trumpet call or herald announced his approach; no pomp or ceremony attended him. He came without show of splendor or magnificence, an incongruous figure in the night . . . riding a Missouri mule! King Hussein was a connoisseur of mules, preferring them to any other means of conveyance. His buyers scoured South Africa, South America, and Abyssinia for the best in muleflesh. But none satisfied him so well as the good, old Missouri hardtail. It remained his favorite brand.

After enjoying a boom during World War 1, the mule industry had a few good years immediately following the peace. In addition to the home market, there was a big demand for Missouri mules in Europe. The Germans, having seen what the Missouri mule could do on the Western Front, were the largest importers. Italy, France, and Spain also purchased them, and many Missouri college boys received a liberal education in escorting herds of Missouri mules across the Atlantic. Each attendant had twenty-two mules which he fed, watered, and supervised. In return, the mule's valet was given a free ride to Europe and back.

The exporting of mules to Spain completed a cycle of history. The mule came from Spain to the New World. Four centuries later, he went back, a larger, stronger, more efficient animal, developed by the continent which he helped to develop. As the economic situation in Europe deteriorated, mule trading declined. By 1929, the high rate of exchange and the general condition of international trade all but wiped out the trade.

The mule population of the United States increased up until 1925, and then the years of decline set in. In 1925, there were 5,918,000 mules on the nation's farms. From that time to the present, there has been a steady decrease.

During the late 30's and throughout World War II, mule trading recovered somewhat, prices went up, and the birth rate increased. By 1941, the number of mule colts under one year was almost three times that of 1933. Yet, in spite of

(Continued on page 106)

THE END; next stop is the glue pot.

HISTORY is a tale of the search of living things for protein. Man is instinctively a hunter and protein is the hunted. Even rabbits may be fattened on meat, and a cow does best when her ration is at least 16 per cent protein.

The TAG on the Bag

BY ROBERT ZINN

What do the guaranteed contents of a feed bag mean in terms of quicker gains, fatter stock, and dollars in the farmer's pocket?

IT wasn't so long ago that most farmers knew little more about the proper feeding of their stock than Shorty Summers of Rabbithash, Kentucky. Shorty never heard of a vitamin and he wasn't sure whether protein was a disease or a drink. He owned a half dozen Piny Woods Rooters which he let run in the second growth back of his house. His sows pigged each spring but about half the porkers came to a violent end before they were weaned, and the remainder were butchered or sold early in winter. They got a little corn toward the end, but the fact that they could put on more weight in shorter time was a brand new thought to Shorty.

"What's the rush?" he said. "Time don't mean nothin' to a hog."

Wise farmers today know to a split hair what their stock should do; that 100 pounds of weight can be put on a hog with less than 400 pounds of feed, and that a four pound broiler can be produced in 12 weeks.

These startling modern improvements in livestock production are the result of work done by the nation's animal nutritionists. Their discoveries have put money in the farmer's pocket, reduced his labor, and increased the food supplies of the world.

Their tools are the microscope and the test tube, and their laboratories are the feedlots and the poultry runs. Nutrition is a highly complicated subject, so complicated that only a specialist is equipped to handle the chemistry, biology, physiology, and

other related sciences which are involved in the study of nutrition. Any dirt farmer, however, can acquire a working knowledge of the fundamentals which go into practical feeding. Such knowledge will better enable him to follow sound practices—and thereby turn out a big hog sooner, or a gallon of milk or a dozen eggs at less cost.

Nutrition is the process whereby an animal takes in and uses feed nutrients for its body processes and production. These processes are such things as breathing, the beating of the heart, digestion, walking and eating. Production is the laying on of fat, the giving of milk, the laying of eggs, producing young, or working.

Feed nutrients are the substances, in feeds, which supply nourishment to the body of the animal eating the feeds, causing him to grow and/or produce something. There are six important nutrients, generally referred to as "the six basic food nutrients." They are: proteins, carbohydrates, fats, minerals, vitamins, and water.

These six form a team; they work as a team, and like all teams, this one is only as strong as the weakest member.

Protein

Protein has three uses: (1) It is used by animals to build new tissue, as in growth and reproduction. (2) It is used to repair old tissue that has been worn out by the stresses and strains of living and producing. Lean meat, skin, feathers, hair, hoofs, horns, are made up of protein. (3) It is used in producing eggs, milk, wool.

There are three sources of proteins: (1) Animals, (2) Plants, (3) Organic Chemicals. Examples of animal protein are tankage, meat scraps, fish meal, and milk. Examples of vegetable protein are soybean, linseed and cottonseed oil meals. At one time each of these was part of a growing plant.

The third source of protein is unique in that it is man-made, or synthetic, and is neither of animal or plant origin. Urea is an example of such a substance. Urea is a product of the chemical laboratory made from air, coal and water. It is equivalent to 2½ times its weight in protein effect because it has an extremely high nitrogen content, 42 per cent.

Urea can be used successfully only by ruminants, animals with multiple stomachs such as cattle and sheep, and not by single-stomached animals such as pigs and chickens. Because one pound of urea is equal to 2.62 pounds of protein from an animal or vegetable source, it is one of the best means for stretching supplies of protein ingredients. During the wartime feed shortage urea played an important role in extending the sources of protein feedstuffs. When urea is fed according to the recommendations of nutritionists, it is a safe and satisfactory product. When fed in amounts above recommended rates, it is a most unsatisfactory product and can cause the death of the animal.

The question of how much protein an animal should have in its ration is always in order. The needs of an animal for protein vary quite widely depending primarily upon two things: (1) the age and (2) the stage of production. New tissue is laid on more rapidly by a young, fast-growing animal than by one that has reached maturity. Therefore, young growing animals have a high demand for protein in their ration if they are to do well. Animals producing high protein products such as eggs, milk and meat will need considerably more protein than animals

THESE TWO BIRDS are each 114 days of age. Both are roosters. The big boy on the left was fed an ordinary ration while the sad sack on the right was fed a ration deficient in riboflavin. These extremes would not show up on the farm.

TO FINISH a prize animal requires an exact knowledge of nutrition and feeding in addition to know-how, which only experience can give.

not in production. A cow at the height of lactation will need more than a cow which is going downhill in production.

The percent protein that any given ration should actually carry can be given with a reasonable degree of accuracy. While the opinions of animal husbandmen vary some in this matter, the differences are not great enough to be significant as far as the well being of the animals or birds being fed is concerned.

As has been previously mentioned the needs for protein change as the status of the animal changes. Young growing animals need more protein than mature animals; animals in production need more protein in their feed than animals that are out of production; and working animals need a greater amount of protein than animals that are at rest.

The percent protein usually considered desirable in the rations of pigs, chickens, turkeys, and dairy cattle are listed below.

Animal	% Protein Dry Lot	% Protein Pasture
Brood Sow During Gestation	16	12
Brood Sow During Nursing	16	12
Pigs During Suckling period	18-20	16-18
Pigs From 50 lb. to 150 lb	14-16	12-14
Pigs from 150 lbs. to Market	12-14	10-12
Boars preparatory to Service	16	12

Chicken	% Protein
Replacement chick—starting	20
Replacement chick—growing	16-18
Mature laying bird	15
Broiler chick—starting	20-24
Broiler chick—growing & finishing	20-22

Turkeys	% Protein
Starting	25-30
Growing & Finishing	20

"WHAT are they feeding you son?" No scientist has ever concocted a better feed than milk. All good feeds closely approximate milk.

PIGS HAVE ALWAYS known what farmers are just finding out—that the Animal Protein Factors in cattle droppings boost both growth and health. Instinct takes this scrawny character to the right spot for help.

Dairy Animals	**% Protein**
Starting Calves	16
Growing Stock	13
Cows during dry period	13
Cows in milk production (with good roughage).	16

In addition to this information it is interesting to see what total feed consumption can be expected from these same animals. When information of this kind is tabulated, it should always be remembered that it is impossible for anyone to say exactly what one animal or one group of animals will eat in any given time because animals are all different and their appetites differ widely. This is true between individuals and from day to day with the same individuals as is true with humans. At best such figures as given below can be considered estimates only. These figures do make a worthwhile guide when computing what feed consumption for any given animal may be.

Total Feed Requirements for Hogs

Wt. of Pigs	*Total Dry Feed Per Head Daily*
25 lbs.	1.5 lbs.
50 "	2.5 "
75 "	4.0 "
100 "	5.0 "
125 "	6.0 "
175 "	8.0 "
225 "	9.0 "
275 "	10.0 "

Sows during the gestation period will eat approximately 1.5 lbs. feed for each 100 lbs. body weight.

Sows during the nursing period will eat approximately 3.0 lbs. feed for each 100 lbs. body weight.

Mature boars will eat, on the average, about 2 lbs. per 100 lbs. body weight.

Total Feed Requirements for Chickens

Replacement chicks—
1 lb. starter first 4 wks.
1 lb. starter from 4 to 6 wks.
Total .....2 lbs. starter first 6 wks.

Replacement chicks during growing period—from 6 to 20 wks.
7 lbs. growing mash.
11 lbs. grain.

Mature laying hens—per 100 hens laying at 50%—
14 lbs. egg mash.
14 lbs. grain.

Total Feed Requirements for Broilers

Starting period.....2 lbs. starter first 5 wks.

Growing and finishing—1 lb. broiler feed per wk. from 5 wks. to 12 wks. producing a 3 lb. broiler on a feed efficiency of 3.5 lb. feed per lb. gain.

Total Feed Requirements for Turkeys

Starting.....8 lbs. starter first 8 wks.

Growing and finishing—From 8 wks. to 28 wks.—or a 20 lb. bird.
40 lbs. growing mash.
40 lbs. grain.

(Continued on page 119)

RYE

SOIL BUILDER and FORAGE

IF there is a grain crop that the scientists have neglected in recent years it is rye, for there has been little written on the subject since Robert Burns wrote "Coming Through The Rye," back in 1792.

But rye, which ranks fifth in production among our grain crops, is no newcomer to the farm scene. Ancient records reveal that it was grown in Spain by Roman colonists as early as the first century B. C. Down through the ages rye has always been a widely planted crop.

Today it is raised in many parts of this country as a grain crop, a cover crop, a green manure crop, and as pasture for early spring and late fall grazing. One of its major jobs is serving as a combination winter cover and green manure plant. Farmers like rye for this ability to do two jobs with one planting.

Farmers plant more than three and a half million acres of rye annually across the country, and the total acreage has increased slightly in recent years. Of this acreage, one and a half million acres are never harvested for grain. This is the rye, which farmers, aware of the erosive force of winter rains and the need of humus in the top soil, are planting primarily for fertility insurance. Rye's combination of winter hardiness and a large bulk of green growth makes it a good choice for soil protecting jobs.

R. E. Decker, Head of the Farm Crops Department of Michigan State College, says of his state, "Rye as strictly a cover and green manure crop is gaining favor with our potato growers." He points out that, without a doubt, it is of much value when planted to precede a cultivated crop and adds that of the 139,000 acres grown in Michigan in 1948, fully one-half was used for cover and green manure. From Illinois, which grows 60,000 acres of rye each year, comes the opinion that rye is well suited for winter cover and that it not only provides cover quickly, but also permits the establishment of perennial grasses and legumes. Agronomists in Kentucky point out that farmers in the Blue Grass State consider rye an excellent cover and pasture crop. Farmers in southeastern Missouri are using rye to hold their sandy soils against wind erosion. Webster Pendergrass, Extension Agronomist for Tennessee says, "Rye is a very good crop for winter cover in Tennessee. It can be seeded from early to late fall, makes a good growth, and stands the winter quite well."

First among the characteristics of rye which make it excellent for a cover and green manure crop is its rank growth. By late spring a good crop of rye may be so heavy that neat plowing

is difficult. But this is good for the land, because as the green plants rot and become part of the soil, they increase tilth and fertility. Soils treated with green manures gradually become more granular, which leads to better aeration, moisture holding ability, and less compaction from heavy rains.

Iowa agronomists list the advantages of cover crops, of which rye is an important members, as: 1. They cover the soil from August to May when one-fourth of Iowa's annual soil losses occur. 2. They add organic matter to the soil. This in turn, builds up the soil's erosion resistance during May and June when another one-half of the annual soil erosion is likely to occur. 3. As the green matter breaks down it adds nitrogen to the soil. A mixture of rye and a legume can add 30 to 60 pounds of nitrogen to the acre if the legume seed is properly inoculated and the soil is suitable for growing the legume. 4. The increase in nitrogen from green manure crops containing a legume shows up as better yields in following crops.

When a sodded field, or one which has been out of cultivation for a couple of years, is planted to rye, the seedbed should be prepared the same as for wheat. The field should be plowed four to six inches deep, double disced and harrowed before the rye is drilled. When a field is planted to rye after the corn is harvested, the soil can be prepared with the disc if the weed crop is not too heavy to disc down. The seed should be drilled about two inches deep on light soil and one inch on heavy soils.

Rye can be planted later than wheat and still make good growth and yield, because it is a more hardy plant and less subject to winter killing. Throughout the Midwest and the North Central states, however, it is best to get the seed in the ground some time between August and the last of October. Early planting helps insure a heavy blanket of cover to protect the soil during the winter months. Some northern farmers prefer to plant their rye when the corn gets the last cultivation. This is a good plan for the farmer who has a between-row drill and can borrow a horse, since planting at this time requires no additional soil preparation.

The seed can be broadcast and worked into the soil by going over it once with the harrow. Tests at experimental farms, however, have revealed that grain yields are higher when the seed is drilled.

The rate of seeding for rye varies with the use to be made of the crop. If the rye is planted for pasture it should be seeded at the rate of two to two and a half bushels per acre. A bushel and a half of seed is adequate when rye is planted for a winter cover and green manure crop, and also when the rye is planted for the grain harvest. Rye seed sold in 1949 for about $2.40 a bushel.

RYE has two big jobs; it protects soil in winter, and enriches it when turned under in summer. It serves best with legumes.

(Continued on page 110)

MUCH RYE is threshed instead of combined because good rye straw finds a ready market with manufacturers of bottle protectors, horse collars, and nursery stock wrappers.

Spring ALMANAC

When that Aprille with his shoures soote
The Droghte of Marche hath perced to the roote.
—CHAUCER

GIVE the kids molasses and sulphur for that peaked look.
Air featherbeds and winter woolens.
Give the feet a treat; take them wading.
Cook a batch of dandelion greens with a ham hock.

Take down the storm windows; put up screen doors.
Store red flannels in moth balls.
Cull the lazy hens. (See Farm Quarterly, Winter 1947).
Stand an old broom outside the kitchen door for muddy feet.

Make the hotbed early; use well-aged horse manure.
Stay up nights with lambing ewes.
Give the new-hatched chicks twelve hours behind the kitchen stove.
Turn the compost pile and add lime and fertilizer.

Set broody hens with fifteen eggs; mark them well.
Take the leaf mulch off the bulbs.
Give the fruit trees a dormant spray.
Keep the cat away from the nesting robin.

Read the Bible.
Topdress the pasture with 4-12-4 and renew with a legume grass mixture.
Tie up the dog; his fancy turns too.
Watch for spring sniffles; keep the feet dry.

Clean out the gutters.
Fill the mudhole under the barnyard gate.
Thin the blood with sassafras tea.
Buy a new bonnet with a blue ribbon on it.

Guard against the ravages of spring fever.
Look for morel mushrooms when apple trees turn pink.
Set out rosebushes. Keep their feet dry.
Don't plow across gullies.

Prune grape vines; leave three buds to the twig.
Don't turn the cow on pasture until it has a six-inch start. (The pasture).
Plant radishes and lettuce early; frost won't harm them.
Plant spring posies in flats; use plenty of sand.

Watch the heat in the brooder house; have substitute heat at hand.
Kiss all the June brides.
Keep young pigs from chilling.
Be patient during house cleaning.

Beware of peddlers of spring tonics.
Tie poultry wire around young fruit trees.
Keep away from trees during spring storms.
Take spring bath only after weather is well settled.

Look to the beehive. Perchance a new queen is needed.
Plant oats early.
Take the cow to the bull.
Change to summer oil in the tractor.

Watch for bloat in pastured cattle. Feed some hay at first.
Consult seed catalogues early, say, in March.
Follow markets and quotas in planning crops.
Prune fruit trees before the sap starts.

Control the gypsy urge.
Reset fence posts loosened by frost.
Seed the lawn; roll when not too soggy.
Nibble on a fiddlehead.

Do not spare the hoe in the young garden.
Look for the timid violet beside the mossy stone.
Go fishing.
Shore up the gullies against washing. Watch the topsoil.

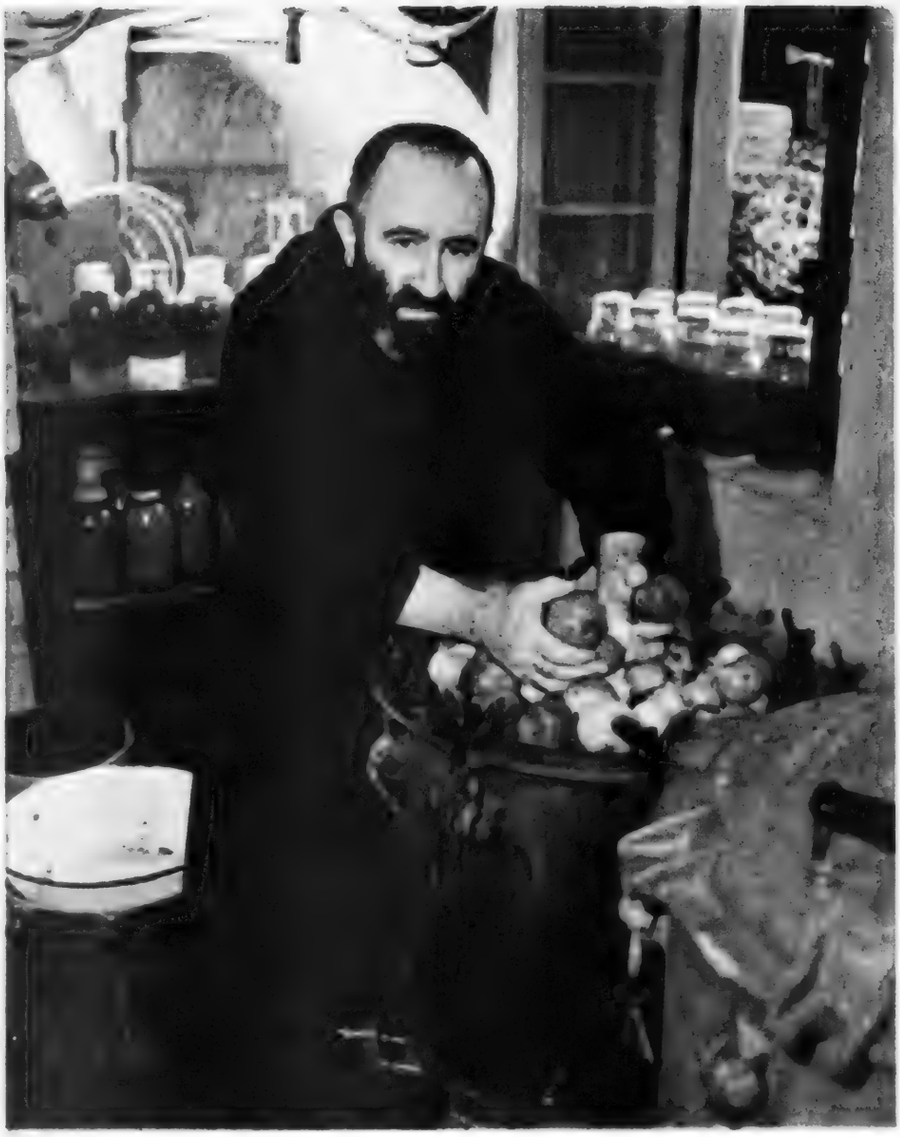
Give orphaned kittens a home in the barn.
Plant cucumbers when the moon is full.
When the sap starts, slippery elm bark is prime.
Soften stiff boots with neatsfoot oil.

Pick the geese.
Trade roosters with a neighbor.
Stay off wet fields with the manure spreader.
Buy certified seed.

Get a quantitative soil analysis if you can.
Give as much attention to pastures as row crops.
Secure flood gates against spring freshets.
Breed gilts for fall farrowing.

Plant the hybrid recommended for your county.
If alfalfa fails try birdsfoot trefoil.
Set out the strawberries and asparagus.
Buy a straw hat.

Oil machinery before using. Oil and store under roof when finished with it.
Swear not at the weather.
Help thy neighbor when he needs it.



THE SILENT FARMERS

BY GEORGE LAYCOCK

In Iowa, a community of Trappist monks lives in self-imposed silence much as they did in medieval times. But their farming has gone modern.

WHILE the citizens of Dubuque, Iowa, are still getting to bed at two o'clock in the morning, the Trappist monks at New Melleray Monastery, 13 miles southwest of town, are already up and about their day's work.

New Melleray is a 3100 acre farm nestled in the rolling hills of northeastern Iowa. The spires of its buildings can hardly be seen from state highway 151, which carries a constant stream of speeding traffic along the ridge two miles to the east. The monks chose this location more than 100 years ago because they wanted to remove themselves as far as possible from civilization. They built their first monastery of wood and enclosed it with rows of pine trees which now almost hide their buildings, old and new. In due time civilization closed in on them, but the monks, surrounded by a modern fast-moving world, still refused to be modernized. It was by their own choice that they were following the silent austere life of the Trappists, much the same as other Trappists had been living for the past 900 years.

The Trappist follows the strictest or-

der of the Catholic Church, the Cistercians of Strict Observance. The Order was founded in 1098 on the teachings of Saint Benedict. The Trappist's primary job is to give praise to God. Farming is their means of sustenance, but their farming, unlike their living, has kept pace with the times.

Their life of abstinence and denial prepares them for their worship in the chapel. The Trappist has no personal property. He has no magazines, newspapers, or radios; not because they are evil, but because they are diversions. He does not keep abreast of world events, for he figures that life on this earth is only a pause in the span of time, and he must be about his work of giving thanks to the God who promised him a life to follow this one. To follow the life of Christ and keep his mind on worship, he denies himself all the worldly goods that he can do without. This austerity extends to the dining table, for Trappists are vegetarians; they eat no meat, fish or eggs unless on a doctor's orders.

No Talking

Trappists are forbidden to talk, for talking takes their minds off their meditations. They may speak to their superiors or to each other with the permission of the Abbot. For discussing essential matters they use a simple sign language, which allows them to communicate silently. Most of their talking is done in the chapel during the several hours of daily worship when they repeat the offices of their Order.

THE MONK at the milking machine is Brother Nicholas, formerly of St. Louis, Missouri. He gives a cow directions by pushing her with his hands, or slapping her on the rump.

AT CORN PLANTING TIME the monks work in shifts to get the seed in the ground. They raise all their own stock feed, and once planted 435 acres of corn in five days.

THIS MECHANICALLY INCLINED monk keeps busy repairing the farm tractors, trucks, corn harvester, and combine. He can think but not speak when he skins a knuckle.

A TRAPPIST mechanic displays the symbols of his religion among the tools of his craft. He is free to continue his meditation while he goes about his work.

The Trappist monk's clothing is simple. If he is a priest in the Order, he wears a white robe. If he is a lay brother, his robe is brown. When he retires at night he removes only his shoes and socks so that when he is awakened at two in the morning, it takes him only a few minutes to go to the chapel for worship. Each monk has his small, curtained cubicle equipped with a solid wooden bed and a thin straw mattress, to which he retires for sleep at seven in winter and eight in summer.

A Trappist's hair is cropped close to his head. After a priest takes his final vows he wears a strap around his head when his hair is cut. The fringe of uncut hair beneath the strap forms his monastic crown. The priests shave but the lay brothers wear beards.

A SHOE SHOP and a Trappist cobbler eliminate another link with the outside world.

A Trappist's poverty stays with him even in death, for he is buried in the monastery graveyard wrapped only in his robe. Dead priests are buried facing East, lay brothers facing West.

Discipline is strict in a Trappist monastery. The rules are many and the monk who breaks a rule can expect the Abbot to impose a penance. If he talks when he is not allowed to, he may have to kiss the feet of the community. This punishment takes place at the dining table when the whole community is assembled. The monks put their feet on the foot rests beneath the tables, drape the edges of their robes over their shoes, and the offender goes from one to the other kissing the covered feet of every monk in the room. For serious offenses he may have to take his dinner on the floor in the middle of the dining hall, where he must sit on a low stool especially made for such occasions.

While all the monks live the same austere life within their monastery, their duties in the Order may vary. The priests have as their major job the glorification of God. The lay brothers take as much of the manual labor off the hands of the priests as possible to release them for worship. During a busy harvest season, however, all the monks take their turns in the fields. The priests have beds as hard as those of the lay brothers, and they get no more to eat.

The Trappists are contemplatives. While other Orders of their church concentrate on teaching, preaching and missionary work, the Trappists devote their time to prayer. "We try," says Father Eugene Martin, Abbot of New Melleray, "to make up to God for some of the insults which he takes from the rest of the world. Some people do not take time to offer him the praise that is his due. We try, in a small way to make up for this."

New Melleray is the second oldest of six Trappist monasteries in the country. While there are Trappist monks in most parts of the world, there are less than 500 in this country. After the recent World War the monasteries became crowded with ex-soldiers who wanted to become Trappists. New Melleray has taken in 22 ex-service men in recent years.

In addition to praying, the Trappists must make a living, and their living comes from their farms, for Trappists have always been farmers. "Farming," they say, "fits into our kind of life, for even when we're working in the fields, we can continue our meditations." Farmers have always worked alone, close to nature, and often in silence for hours at a time.

Farming Without Talk

The Trappists farm with tractors and combines, chemical fertilizers and hybrid seed, purebred stock and milking machines. The New Melleray farm is run much as any other large Midwest farm. The monks have become proficient in such tasks as repairing machinery and cultivating crops according to the latest recommendations from the offices of

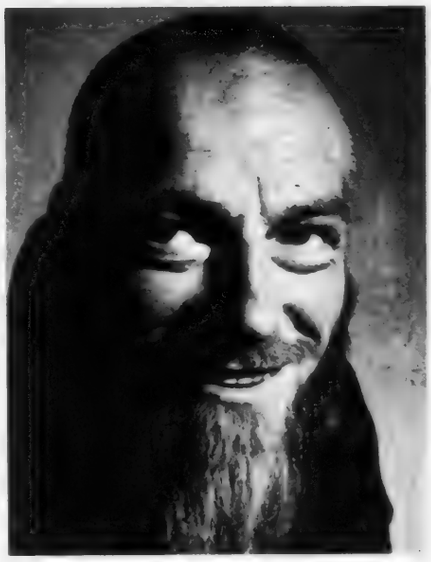
County Extension Agent, Frank Kerrigan in Dubuque.

Brother Peter is general overseer on the farm. He keeps a composite record of the expenditures and incomes from each of the departments, and his word is important when it comes to buying and selling crops or stock. It is part of his job to study agricultural publications to keep abreast of the markets. Working with Brother Peter are other monks in charge of separate departments. Brother Martin handles the poultry; Brother Stephen the beef cattle; Brother Declan the Dairy herd; Brother Thomas the hogs; and Father Maurus is in charge of the bees.

In a normal year the monks harvest 360 acres of oats, 450 acres of corn, 400 acres of hay, 20 acres of fruits from their orchards and vineyards, and 10 acres of vegetables which they eat in season or preserve for the winter. The rest of their land is either pasture or woodlot.

Brother Declan's Dairy Herd

The Trappists at New Melleray are primarily livestock farmers, for the rolling farmlands of northeastern Iowa are ideal for stock. The monastery owns a 50 head herd of purebred Holstein cows which supplies it with milk. The dairy herd is managed by Brother Declan, a friendly, bearded, middle-aged monk who came to New Melleray from Ireland in 1929. For the past 21 years, when not sleeping or praying, he has been working in the cattle barns. "It was a happy day when I was sent to America," he says. "Got away from the fog in Ireland, and besides I knew everybody who lived near the monastery there. That made it difficult. When I saw my old friends I couldn't help thinking of the old times." He reached through the bars of Rockwood Rag Apple Rocket's pen and scratched the huge bull on the head. "I remember when I went into the monastery," he said. "There were three of us. The last thing we did was smoke all the cigarettes we could and throw the rest of the pack in the ditch. That's a hard thing for some of them to give up. I've always worked on a farm. I was a farm boy before I became a monk, and I'm still working on a farm, but this is a



BROTHER JOAKIM, the porter in the guest house, joined the Trappists in Ireland.

BROTHER STEPHEN is in charge of the beef cattle. He is past 60, and has spent most of his life on a farm. He checks his herds on horseback, and still has little use for tractors.

good bit different than the farming we did in Ireland."

Unlike most of the monks Brother Declan gets away from the monastery occasionally. "I go to a lot of sales," he explains. "I've also attended a couple of five-day short courses in livestock breeding in Chicago. Stayed at the Hotel Sherman." The taste of big city life, however, seemed to have no permanent affect on Brother Declan. He was glad to get home to the monastery. He usually puts in a 17-hour day, mostly working with his herd, "But if you tell people that," he says, "They'll say I'm a windjammer."

Brother Declan and the two young monks who help him around the barn are milking only 35 cows of their herd at present. Milking is done twice daily, at four in the morning and four in the afternoon. The milking machines are taking 120 gallons of milk a day from the 35 cows, and this is only slightly more than is required to fill the needs of the monastery. The little left over is separated. The skim milk is fed to the calves, and the cream is sold.

The milk cows get 15 pounds of silage twice a day, and 15 pounds of hay daily. They are fed a 14 per cent protein ration in accordance with their production, but never more than 10 pounds to the cow per day.

Brother Declan prefers breeding with his own herd bulls to artificial insemination. "There's nothing like God's way," he says. "And besides that, they can make mistakes by using the wrong semen." Both of the herd bulls at New Melleray are young and both are descended from Johanna Rag Apple Pabst. Rockwood Rag Apple Rocket is two and a half years old. His calves are just starting to come. "We'll know whether or not he is worth anything," says Brother Declan, "after we've seen whether or not his offspring are better producers than their dams." The other bull, Melleray Ormsby Rag Apple was, like Rag Apple Rocket, raised from a calf born in the monastery herd.

The cattle barns are modern. The floor is concrete, and there is an automatic water fountain between every two cows. The cows, however, are not soothed by radio music, for radios are forbidden in the monastery. New Melleray cows, unlike most animals of their kind, seldom hear the human voice. The monks go about their chores conversing, when essential, in their simple sign language which the cows have never learned.

Brother Thomas and the Hogs

The dairy barns are within a pig squeal of the swine barns, where Brother Thomas, who has passed his sixtieth birthday, looks after three or four hundred hogs throughout most of the year. Brother Thomas, like Brother Declan, came over from Mount Melleray in Ireland. Mount Melleray is the mother monastery of New Melleray.

"If it's hogs you want to know about," he said, "we raise them like anybody else raises them. I figure we aren't doing quite as well with them as we should be. We are bringing them up to 200 pounds in about seven months."

Brother Thomas handles his breeding program so that about 50 sows farrow in spring and around 35 in the fall. "It all depends," he says, "on how the market looks, and how much feed we have raised for the year."

The Trappist farmers at New Melleray have been working toward producing a bacon hog, and at present they are using a Minnesota Number 2 boar. "These pigs don't seem to cause us much trouble at farrowing time," Brother Thomas says, "and I like a type of sow that will have her pigs but let me sleep." He feeds his pigs ear or shelled corn from weaning time on and supplements the grain with a protein ration which is mixed on the farm, and self fed.

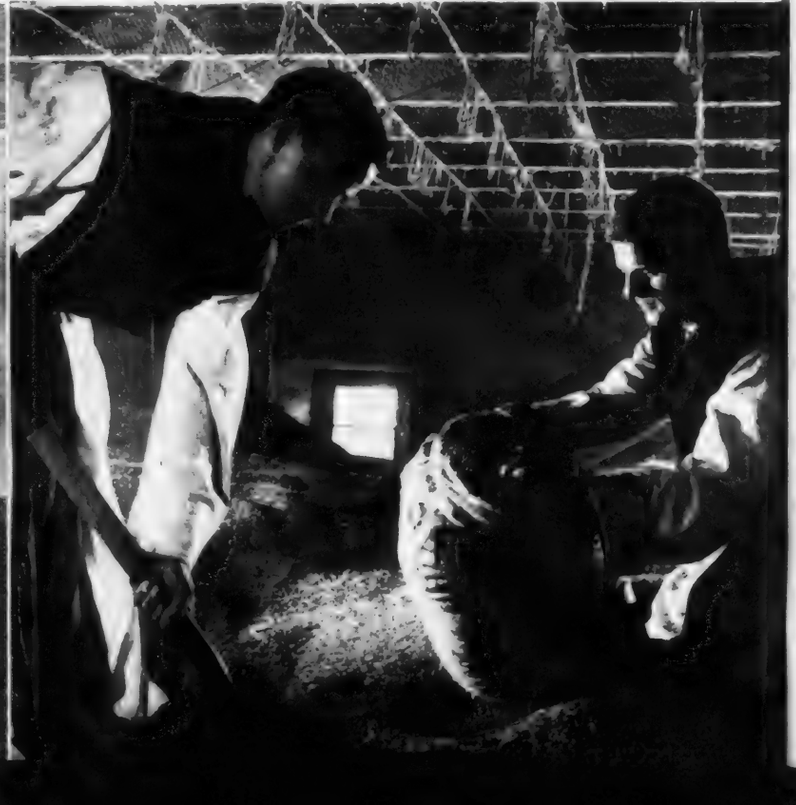
Brother Thomas works hard with his hogs and likes to see them prosper. "Of course," he says, "we raise all these pigs for market. We monks aren't allowed to eat meat."

Brother Martin and the Chickens

Neither are the monks permitted to eat eggs, but they keep a flock of 1,000 leghorn hens and sell eggs on the Chicago market. The chicken department is under the care of Brother Martin, who did not

BROTHER DECLAN never turns his back on the two bulls in the dairy herd. "Haven't seen the one yet, I'd trust," he says.

ON SUCH JOBS as sacking oats the Trappist learns that his robes were not designed for comfort. Much work is done in coveralls.



BROTHER MARTIN, who seven years ago, knew nothing about raising chickens, feels that each hen has an individual personality. He pampers his laying birds and it pays off at the egg bucket.

come from Ireland. Before he entered the monastery, about 13 years ago, Brother Martin was a claims adjuster for an insurance company in Philadelphia. "Before I came here," he said, "I'd seen a chicken and that was about as close as I had come to raising them."

Brother Martin was put in charge of poultry at the monastery seven years ago. "It was a foolish move in a way," he recalls, "because I didn't know anything about chickens. That first year a disease wiped out 800 of our 1000 chicks. We had the vets out and got five diagnoses, all different. We still don't know what the trouble was, but I was ready to quit at the end of the season." Things have changed, however, for Brother Martin's chickens. He seldom has high losses any more among his baby chicks. Last year egg production in his laying flock stayed above 50 per cent the year round.

Brother Martin spends long hours working with his birds. "The average farmer doesn't have the time to fool with them that we do," he says. "That's the reason cafeteria feeding appeals to them. I don't like the cafeteria plan. We've figured out our own feeding program for the laying hens and it seems to be working." He doesn't know whether or not his new feeding plan is responsible for last year's high production, but he plans to continue feeding the same way to see what happens in the next year or two. Until last year he fed oats and a 23 per cent protein concentrate which was mixed on the farm and kept before the birds constantly. In addition, he saw that the birds had 14 hours of light.

"Now," he adds, "we're feeding them small amounts of pellets twice a day and corn twice a day. We moisten the pellets at night and feed the hens just what they will clean up in about five minutes. This way, we're feeding them something about every two hours. We used to have cannibalism and now we are never bothered with it. Until last year it wasn't unusual for us to have 100 blowouts out of every 1000 pullets. This year we have had no blowouts. When you cut down the blowouts, you cut down cannibalism, because a hen with a blowout is going to get picked, and pretty soon they get the habit."

Brother Martin has also changed his lighting program. "We turn the lights on from three thirty in the morning until seven forty-five. Then we cover the windows with curtains and keep it darkened, somewhat, during the laying hours. This is a lot of work, but I think it is paying off."

The chicks, purchased by Brother Martin, are sexed pullets from an old,

LAY BROTHERS, like this one, make up about half of the 108 Trappists at New Melleray Monastery. They do much of the field work and release the priests for worship.

established ROP breeding flock. He prefers leghorns because he is interested in egg production, but last year he also bought 600 sexed LaGourd pullets. LaGourds are hybrid crosses between leghorns and minorcas. "We took an awful beating on those as far as sexing is concerned," said Brother Martin. "Out of 600 there were 50 cockerels." He will give the hybrids a trial to see if they lay better than his leghorns.

Brother Stephen and the Fat Cattle

One of the most important farm enterprises at New Melleray is the raising of beef cattle. Brother Stephen has handled the fat cattle for the past 22 years. He is getting along in years and, like Brother Thomas over at the hog barns, he was once a soldier in the Irish Army. It has been many years since Brother Stephen has seen his native land, but he hasn't forgotten it.

"Ireland's a fine little cattle country, it is," he recalls. "I read in a book," he adds, "that Ireland wants England, and it's not sad I am to hear it."

Brother Stephen feels that these are uncertain times for raising feeder cattle. "Some are making it and some are getting stung," he says. His herd includes both Black Angus and Herefords with a total of nearly 700 cattle. He has a slight preference for the Angus. "And to be sure there's a beast," he said, pointing out a yearling Angus steer. "I see by the market reports that they're bringing top prices at the Chicago market." He likes Angus because he can't see much daylight under them and they make good gains on their feed.

Brother Stephen has been working on a farm since his boyhood days in Ireland. He feels that feed makes cattle, and consequently his beef cattle have feed before them all the time. Outside the loafing barns there are long feed boxes, refilled regularly with ground corn and cob meal. The steers also get a pelleted protein supplement. "If there's a little left over," says Brother Stephen, "What matters then?" He also feeds some hay, but not all that the steers can eat. He would rather they fill up on flesh building feeds than get "hay bellies."

As a member of the old school, Brother Stephen is a little grieved to see the world moving at such a fast pace. "It has a lot of people left in tears already. They're making great progress with their airplanes," he says, "killing people off. Here they won't even put a harness on a horse any more. They're letting the engines do the work. In Ireland, the engines wouldn't last till nightfall. The fields are too rough."

He has never been able to substitute a tractor for a horse in checking his cattle in the fields, and the fact that Brother Stephen is an accomplished horseman, and has the Irishman's love for them, may have some bearing on his distaste for tractors.

Other Enterprises

In addition to its livestock program, the monastery engages in a wide variety of other farming activities designed to make the Trappists largely self-sufficient. They raise about 10 acres of vegetables each year. There are 20 acres of vineyards and orchards which are cultivated and sprayed scientifically.

Father Maurus has charge of the bees. The Trappists harvested between two and three tons of honey last year. There are 50 hives, and the plan is to build this up to 85 during the current year. "We requeened all of our hives with queens shipped in from the South last summer," says Father Maurus, "and they did pretty well. We haven't been bothered with foulbrood, although the bee inspector says everyone around us has had trouble with the disease." The monks figure that the honey produced in their small apiary is just a little extra income, but that the bee industry could be expanded, if the need arose, to make it a major enterprise. Most of the honey is sold to guests in the monastery store, which is maintained mostly for the sale of religious items. The monks use the beeswax to make their own altar candles.

A Monk's Field Work

The monks have mechanized. During the second World War the Trappists, like most farmers, could find no hired help. Generally, they employ about 15 hired men around the farm for there is more work than the monks can handle and at the same time keep up their schedules of worship. In war years they organized into crews, during planting seasons and worked 24 hours a day. In 1945, rains fell late and held up the corn planting. When the weather finally broke they planted 435 acres of corn in five days.

Out of the man-power shortage grew the realization that they must purchase more machinery. Now they have eight tractors, two 10 foot binders, a combine, a field ensilage harvester, a two-row corn picker, two hay balers, one threshing machine, a grain elevator, four trucks,

(Continued on page 92)

THE WELTS on this critter show where cattle grubs have set up housekeeping. They ruin the hide, sap the vitality, and keep the animal's mind off milk and meat production.

The Cattle Grub

BY T. R. ROBB and J. F. SCHINAGL

The Cattle Grub, the offspring of a heel fly, is a hundred million dollar pest that can be eliminated.

IT IS difficult to poison a pest which neither eats nor drinks. The heel fly doesn't, for it has no mouth. In its grub stage it has a mouth and a voracious appetite, but at this point in its life cycle it spends its time inside the cattle which it infests. Known to farmers as the cattle grub, warble or wolf, it burrows beneath the hide, destroys meat tissues, and leaves the animal by cutting a neat hole which damages the leather. Packers annually throw away enough grub damaged meat to feed 83,000 people for a whole year and the cattle raiser is penalized a staggering sum for damage to hides.

This is not the only loss from the insect. When the heel fly season is on, dairy herds fall off in production because one fly trying to light on a cow is enough to keep her mind off milk making for the day. Beef animals would rather stand in the shade or wade out into the pond than to stay in the pasture when the flies are buzzing. Cattle have an instinctive dread of the insect, though it can't bite.

Most people divide flies into two classes, little flies and big flies. The heel fly is a big fly and is sometimes mistaken for the common horse fly which, unlike the heel fly, not only has a mouth, but can bite through the hide of the toughest bull. The heel fly is about one-half inch long, not quite as large as the horse fly; is dark gray or black in color, with yellow bands across its abdomen.

The common heel fly can be found wherever there are cattle, but in the northern third of the country there is a king-sized species called the northern heel fly. The two varieties are very much

alike in color and in the damage they do, but the northern fly takes longer to develop and so prolongs the heel fly season in this part of the country.

Since the fly won't eat poison, scientists bent on his elimination have studied him in order to find some stage in his life cycle when they can do him in.

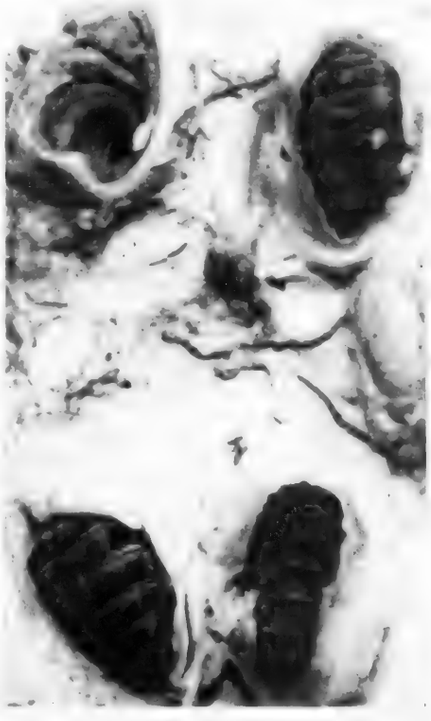
Biography of a Heel

The heel fly begins its life as an egg. It hatches into a grub, changes into a pupa, becomes a fly, mates, and lays an egg. The cycle takes from nine months to a year, but the fly stage lasts only a few days, rarely longer than a week. When it changes from a pupa into a mouthless fly, its belly is full of food, enough to last the rest of its life. A half hour after the female emerges from the pupal case she is ready for mating and a half hour after that she begins laying fertile eggs. She lays as many as 500 eggs in her short span of life.

The fly deposits her eggs on the hair of the heels, legs, and bellies of cattle, a remarkable feat considering that the cattle are frantically trying to prevent this. The egg remains fastened to the hair for three or four days warmed by the heat of the animal; then hatches into a tiny grub which begins its destructive life by boring its way through the skin of the animal. This digging-in process irritates the cattle causing them to lick and scratch the infected spot. Once inside the skin, the grub travels through the muscular tissues to the abdominal and chest cavities, a trip that takes it about two and a half months. At the end of this ten week period many of the grubs that make this trip go to the throat region and can be found attached to the gullet when the animal is slaughtered.

During the next five or six months the grub makes a grand tour of the innards of the animal, burrowing along the surface of the paunch, spleen and intestines, tunneling along the spinal canal, and working its way to the skin along the back. Travel broadens it. When it reaches the back it cuts a tiny hole through the hide to the outside air, moults its skin, which has grown too tight for it, and settles down to eating and growing. The groub's breathing pores are in its tail which it keeps close to the opening it has cut through the hide; at this angle, its mouth is buried in porterhouse steak. On this rich diet, the grub grows rapidly for the next six or eight weeks and then leaves through the hole it has cut and falls to the ground. In central Kansas the first of the grubs takes its departure from its host in late January, others continue to emerge for several months. Further north the first of the grubs will leave the animal a month or two later; in the south this period in the life cycle comes in September and October. The grub remains on the ground for six or eight weeks, depending on the weather, during which time its outer skin becomes hard and blackish and forms the protective case in which the grub changes into a heel fly. Each year this cycle is completed and the pest is ready to multiply and do its damage.

FROM INSIDE THE HIDE, the grubs have cut holes for breathing and as escape hatches.



Property Damage

Without a mouth with which to bite or a stinger of any sort, the heel fly still manages to frighten cattle to the point where they will hoist their tails in air and stampede. One explanation of this fear is that the cattle are terrified by the high whining buzz of the fly. It is even possible that they intuitively link cause and effect and run from the fly to avoid being inhabited by the grub.

The first loss to the owner comes when his animals desert the pasture to avoid the fly. Beef cattle stop gaining weight and the dairy herds drop off in milk production from 15 to 25 per cent during the heel fly season. They can't produce when they leave the pasture for deep shade or the farm pond. The shade and water do seem to act as a deterrent to the fly, however. The common heel fly will not go out over water, though its northern sister is more bold and will follow the animal and lay its eggs above water line. Both varieties prefer the bright sunny pasture to deep shade and many stockmen are providing sheds in the pastures for shade during the fly season.

It is when the grubs hatch and begin their migration through the body of the animal that they *really* begin to cause damage. The infestation of the grubs saps the vitality of the cattle and their burrowing through the meat spoils whole areas that must be trimmed out at slaughter. One packer who keeps accurate records

HEEL FLY EGGS are laid on the hair of cattle where body heat will hatch them.

on losses and devaluations for grubby cattle, reports an actual average loss of $3.65 per head for each animal slaughtered in his plant from November through May. He also reports an average devaluation of $1.25 straight across the board on all cattle slaughtered throughout the year.

Another loss is caused by the holes in the hides cut by the grubs for breathing and escape hatches. Five holes in this most valuable part of the hide will cause it to be classified as grubby, some are so bad that they are sent to the glue factory rather than the tannery. Healing of the grub holes before the animal is slaughtered doesn't wipe the slate clean either. The scar tissue that is formed is also objectionable.

Controlling the Grub

Poison sprayed onto cattle during the fly season doesn't seem to bother the heel fly since it has no mouth and, since the grub spends most of its time safely inside the body of the animal, it is impossible to get to it during this period. But when the grub cuts a hole through the hide for air, it leaves itself open to assault from the outside.

The most direct attack, and one that is used by owners of small dairy herds, is to squeeze the grub gently out of the hole and stamp on it. The gentleness with which stockmen squeeze the grub out is

(Continued on page 95)

A GEORGIA FARM abandoned to briars and poverty grass. These fields once grew lush crops of cotton and tobacco.

KUDZU

BY CHANNING COPE

The South believes the Almighty had its cottoned-out gullies and hillsides in mind when He designed the wonder crop, Kudzu.

WE call it "Earth's Best Friend", we kudzu growers of the South, and we believe we can prove it. We believe it is the best land-holder now known to farmers from Florida to Maryland: the best moisture-holder: the best land-builder: the quickest soil-maker; and the best insurance against summer and fall drought.

It is a good grazing crop, a good hay crop, it can be followed with winter crops, it is perennial, it is a rapid grower and deep-rooted. It spreads, can be controlled, livestock like it, it can take rough treatment, and it is not susceptible to common plant diseases.

How does it compare with alfalfa? About the same; a trifle higher in protein, a trifle lower in calcium content. It will grow on land where alfalfa would starve to death.

How does it compare with the summer grasses? It is richer in protein and minerals, it produces more forage, it improves the land to a greater extent, and it can take the droughts much better.

How does it compare with the annual lespedezas? It can take the droughts better and is a better land-builder.

How does it compare with perennial lespedezas (sericea)? It is more rugged, can withstand the droughts a trifle better, is more palatable to livestock and is a better land and moisture holder.

What Is Kudzu?

Kudzu is a deep-rooted, vigorous, perennial, leguminous vine that provides a dense cover of vines and broad-leafed foliage during the growing season. It grows

RECLAIMED in three years by Kudzu, the same farm now supports a family. Soon the worn-out fields can go back to row crops.

from crown buds and from buds at the nodes of the vines. It has no underground buds below the crown nor buds between the nodes of the vines. The vines grow rapidly during the spring and summer; a growth of 50 feet during a single growing season is not unusual. This habit of rapid growth enables a single plant, under favorable conditions, to spread and cover a large area. Kudzu establishes new plants by forming roots at the nodes where vines come in contact with the soil. These roots enlarge and form new crowns. By the end of the second season, the vine usually dies between the new and the old crown and leaves the new crown separated from the original plant.

The roots of established crowns are fleshy and are sometimes several inches in diameter. If a stand is left undisturbed for several years, roots often penetrate to a depth of three feet or more. The fleshy roots contain a high percentage of starchy material which supports plant growth during the early spring and immediately after tops are removed by mowing or grazing during the summer. Old roots supply a large amount of humus and break up the hardpan.

Where Did It Come From?

So far as is known, kudzu originated in China. It is said to have flourished at the time of Confucius. Apparently it was taken to Japan and was brought to America as a part of a Japanese exhibit at the Chicago Fair in the eighties. C. E. Pleas, of Chipley, Florida, is generally credited with having introduced kudzu to the South, having brought some of the crowns from the exhibit in Chicago. He discovered that it was a vigorous grower, and that it was an excellent soil-builder. He became the chief advocate for the oriental vine and spent many years in introducing it to farmers at county fairs and other places where he could find them in numbers. Mr. Pleas is still alive and remains an enthusiastic advocate of kudzu to this day.

Some years ago, when the Kudzu Club of Georgia was formed, it was urged that a monument be erected in honor of Mr. Pleas, but was declined by him on the ground that the thousands of acres of the Southland now being held, improved, and converted into feeding grounds for livestock was monument enough for anyone.

What Does It Do?

In the Southeast,and in many other parts of the earth there is need for a heavy-duty close-growing plant that will hold the soil against erosion. Typical of this situation is the Piedmont section of the southeast. Here the land is heavy clay, very sugary in texture, is sloping, is acid, and has been pretty well farmed out by row-cropping. Much of the land is in pine trees, but there are millions of acres of open upland, once the scene of the prosperous cotton producer. The steepest acres of this land are classified as Class 4 by the Soil Conservation Service, with slopes averaging about 11 per cent. Here most of the topsoil is gone and there is no present

KUDZU is not only a permanent forage crop, but it fits well into a rotation. Here it is stripped with corn and will take over when the row crop is harvested.

possibility of these acres producing profitable row crops. Kudzu can take them over completely in three years time if planted and fertilized properly. Once the vine covers up this steep land the soil losses are stopped completely and the loss from moisture is reduced to an insignificant. minimum. A four-year study of soil and moisture losses on this type of land where planted to cotton in comparison to kudzu shows the remarkable holding qualities of kudzu. The cotton land averaged a run-off loss annually of 12.48 inches of rainfall and an average annual loss of 26.23 tons of topsoil per acre, while the kudzu land averaged an annual loss of 2.68 inches of water and .20 tons of topsoil per acre. These figures were gathered at the SCS Experiment Station at Watkinsville, Georgia. for the years 1943-1946.

Kudzu not only "takes them over"—these lands which need holding—but it "makes them over." A well established kudzu field is from knee to waist high in a dense. lush. growing mass of green leaves and vines. Naturally, a great many of the lower leaves sluff off due to a lack of light. These leaves, together with the runners criss-crossing in every direction, make up a sort of mattress, from 4 to 12 inches deep. This matter is quickly converted to humus. Applications of lime, phosphorus, and potash convert this humus into a balanced plant—producing medium of exceptional capacity. It causes the kudzu itself to grow faster and there is more of it. but in addition the land is made ready for ensuing crops such as winter grazing crops of small grain or rye grass, or for succeeding summer crops of corn, cottton, grain sorghum or winter grain.

At the Alabama Experiment Station at Auburn. Alabama, kudzu was planted in the Spring of 1916, and turned in the Spring of 1919. In 1916 there was a little growth: in 1917 the ground was covered. and in 1918 the growth was dense. Results of this experiment reported in Alabama Bulletin 232. Experiments with Legumes in Alabama. showed that the average yield per acre of sorghum hay following kudzu was increased by 2,536 pounds in 1919 and 1920. The average yield of four crops of corn following kudzu increased from 14.7 to 34.0 bushels per acre. Similarly, the average yield of seven crops of oats was 7.9 bushels more per acre than the yield on the adjoining plot where kudzu was not grown. In 1929, ten years after the kudzu was plowed under, the kudzu plot yielded 9.2 bushels more of oats per acre than the adjoining plot where kudzu was not grown.

It is becoming commonplace to follow kudzu with oats, rye-grass, crimson clover. Oregon common vetch, or Caley peas. The kudzu is grazed to the ground immediately after September 15th and the winter crops disced into the residue. Grazing is ready by March. Another popular rotation with kudzu is corn. Both are summer crops and the farmer plants the corn in alternate strips about 30 feet in width. There is a strip of kudzu about 30 feet wide and next to it is a strip of corn

A KUDZU ROOT taps the subsoil for minerals, breaks up hard pan, supplies tons of humus to the acre, goes deep for moisture.

THESE HIGHWAY EMBANKMENTS are locked tight against erosion by Kudzu. It will do the same for the gullies and hillsides on farms and furnish a high protein feed, too.

about 30 feet wide. The corn is cultivated as usual and when it is laid by about July 4th, the kudzu runners begin to move in from the adjoining strips and by autumn the corn land is fairly well covered with the vines. These do not compete with the corn for nutrition or moisture, for they get their living from the adjoining strips where their roots are growing. Next year the corn strip is devoted to kudzu and is caught up by the end of the growing season. Corn planted in this way averages about 30 bushels per acre on Class 3 land.

Kudzu As A Grazing Crop

Next to holding soil and moisture, kudzu's chief value is in its capacity to furnish grazing through the drought seasons of summer and autumn. In the sections where kudzu grows well there are periods of drought extending from two to six weeks during which the upland pastures of Bermuda, white Dutch clover, and Dallis grass soon play out. Kudzu steps in to save the day, its deep roots underground, its sub-surface humus and mattress of surface crop residue combining to keep the vine growing, or enabling it to hold its own until the rains return.

As mentioned previously, the kudzu leaves and stems furnish a quality of grazing equal to alfalfa, the protein content of kudzu being slightly greater than alfalfa and the phosphate and calcium content being slightly lower. All forms of livestock and poultry are fond of kudzu. It is succulent, palatable, and nutritious. It withstands the trampling of livestock without injury. Gains in weight of beef cattle on kudzu have raged from 225 to 325 pounds per acre when grazed one animal to the acre from May 1 to October 1.

It does not do well with a pasture mixture with any other summer grass or legume for it either smothers them out or fails itself to get established. Winter pastures can be used in the same field, following frost. Kudzu is often planted around the fences, thereby adding to returns from the field, for it covers the fences and provides cover for useful wildlife.

Kudzu As Hay

Kudzu hay is palatable, rich in protein and minerals, and is relished by all forms of livestock. It is a complete feed for rabbits. Kudzu is hard to cure, though the mowing of it is simple enough. An outrigger (developed at Auburn, Ala. Experiment Station) is fastened on the mower blade and the kudzu vine is clipped clean at the end of the blade as is the case with grass, lespedezas or alfalfa. The stems dry slowly and care must be taken to take up the hay when dew is on the leaves to keep them from shattering. The new device which mashes the juice from stems of Johnson grass might prove effec-

(Continued on page 88)

HERE THE VINE has climbed a guy wire, blossomed, produced a crop of seed pods.

IN HOPPER COUNTRY, screen doors keep the live ones out, but dead grasshoppers can be tracked all through the house.

The Eternal Plague

The best that man can hope for at present in his fight against the grasshopper is a stalemate.

WESTERN farmers have long become accustomed to counting in the grasshoppers when they plan their crops. They must raise enough, not only for their stock and themselves, but also for the hoppers. Early settlers in the West were periodically threatened with ruin as clouds of grasshoppers moved across the country, hiding the earth and darkening the sky. Although weapons against them have been developed, they are still a damaging pest.

Last summer 500 airplanes swooped back and forth across Western fields in the biggest grasshopper blitz in history. Some of the planes were owned by the USDA; others were leased for the job from private fliers. Made-over Army C-47 transports were loaded with three tons of poison bait. Flying at altitudes of 150 feet, they spread the bait in 150 foot swaths, covering 1200 acres in six minutes flat, then went back for seconds. At the end of the summer these modern insect fighters had succeeded in keeping the hoppers in check. But there were still enough grasshoppers left to promise another heavy infestation for this summer.

With discouraging regularity the grasshoppers have reappeared each year since the West was opened to farming. About once every 10 years there is a heavy infestation and the farmer is faced with the possibility of having his range lands grazed to the roots by insects and his grain crops eaten off to the ground. Even between the years of serious infestations, the farmer has never been able to let up in his hopper killing efforts, for grasshoppers don't need encouragement to reproduce. They need only the opportunity.

The grasshopper is a different animal from the Morman cricket, which also causes occasional heavy losses to Western agriculture. The cricket is a clumsy, heavy-bodied insect which migrates in large bands, cleaning off the vegetation as it goes. It earned its name in the summer of 1848 when it invaded the newly turned farm lands of Brigham Young's settlers in Utah and threatened to destroy all their crops, leaving them with little food for the coming winter. Even fire failed to check the crickets. When things looked blackest, flocks of sea gulls started flying in from Great Salt Lake. The gulls gorged on crickets until there were few left; the grateful Mormans erected a monument to the gulls in Salt Lake City. Both crickets and grasshoppers have been called "locusts," and are referred to as such in the Bible.

A horde of grasshoppers can, and often does, graze range land so close to the ground that even sheep find no grass to nibble. This opens the land to wind erosion, and more than one scientist has saddled the grasshopper with the responsibility for some of our dust bowls.

The insects have completely destroyed fields of corn in South Dakota and other Western states, sweet clover in Wyoming and wheat in Montana. Even in Eastern

"IN BAD HOPPER YEARS," said this farmer, "you have to protect yourself with a club." New insecticides help control them, but grasshoppers are probably here to stay.

states occasional outbreaks are serious enough to cause the loss of forage, fruit, and other cultivated crop.

For several years prior to the summer of 1949, growing conditions were good throughout the West and farmers managed to keep the hoppers under control. Last year, however, farmers had to contend with both droughts and hoppers, for grasshoppers flourish best in dry seasons when their natural enemies, such as flies, ground beetles, spiders and disease, are less prevalent. It is these enemies which keep grasshoppers from over-running the earth, for compared with their reproductive powers, man's bug fighting efforts are puny ones. On occasion research men have tried to conquer the grasshopper by spreading fungus disease among them. The plan never worked out. In the wet years the fungus works on the grasshoppers without being planted and during dry seasons the diseases won't prosper regardless of how widely they are artificially planted.

Early farmers in the West had little protection against the "locusts." They were forced to rely mostly on gulls and prayer, but they soon decided that there is truth in the old adage that divine help goes to those who help themselves. They started looking for weapons to use against hoppers. They made poison baits and long lines of farmers walked across the prairies, spreading the bait, a mixture of bran and poison, by hand.

Later the Model T Ford played its part in the grasshopper war. Farmers made mechanical cyclone bait spreaders, mounted on two wheels and hooked them on behind their Model T's. Lines of these machines chugged across the flat fields, spreading a 30 foot swath of bait, much faster and farther than men had ever been able to do by hand.

Thousands of tons of grasshopper bait were mixed by hand on wooden platforms and in cement mixing boxes. Today, the bait is mixed at large mixing stations equipped with special revolving tanks. It is then loaded into trucks which shuttle it to waiting airplanes.

The Grasshopper Census

One new refinement which has been added to the grasshopper control program is the yearly series of grasshopper surveys made by the USDA. Department of Agricultural entomologists now make annual forecasts of the possible danger from grasshoppers each summer. The hopper no longer has the element of surprise in his favor, as did those swarms which swept over the prairies in the seventies.

The surveys are made three times a year. The first one, conducted in late summer, shows where the adults of the

(Continued on page 91)

HOPPERS CLEAN off the range then munch on the bark of trees and fence posts. They will even test the barb wire for flavor. They die before winter, but leave millions of eggs behind. ▶

FARM FIRES

Removing fire hazards will prevent nine out of ten farm fires, but, when the unavoidable fire occurs, farmers should have the proper equipment to fight it.

THE telephone in Walter Sollar's home rang, three longs and a short, just as he was finishing lunch on a cold January day in 1949. The excited voice of Mrs. Harold Mark told him that their seed house was on fire. Sollar's son started for the Mark place with all the extinguishers they had and Sollar began phoning the fire departments of the nearby Ohio towns.

"The Sabina fire chief told me that he was sorry, but he couldn't answer the call," Sollar recalls. "He said that his men wouldn't be covered by workmen's compensation if they were hurt and his equipment wouldn't be covered by insurance if it were damaged because the fire was outside of his contract district. I phoned the Washington Court House fire department and Chief Hall told me the same thing. Hall said that he would come himself, but he couldn't risk his men or equipment. I phoned all of the neighbors on our list of those that have fire extinguishers and started over myself."

"When I left the house," Sollar continued, "I could see the smoke from Mark's place a mile away. The fire was on the second floor of the seed house and the smoke was so bad we couldn't get up there. We rescued about 1500 bushels of seed corn on the first floor. Only Chief Hall with his gas mask was able to get right up to the fire with the extinguishers. At one time we thought he had it out, but then it started up again and we ran out of water.

"Mark was over in Iowa at a cattle sale at the time," Sollar said, "and we had to phone him that the seed house had burned to the ground. That must have been really tough news for him. He had the place insured, but the insurance didn't cover everything he lost. I know. I had a barn fire about ten years ago and I'm still missing things that were burned."

No one was sure what caused the fire in the seed house so the insurance company statisticians classified it under miscellaneous, a heading that accounts for seven per cent of farm fires. At the head of this list is lightning, which causes 37 per cent of all farm fires. Next comes defective chimneys, flues, cupolas and stacks, which cause 11 per cent of the fires. Then follow in order, petroleum and its products, matches and smoking, sparks on roofs, stoves, furnaces, boilers and their pipes, spontaneous ignition, and the misuse of electricity. The insurance companies say there is a farm fire loss of well over 100 million dollars a year. How much more than this staggering figure is lost they do not know, since this is the estimate of what they pay out and it does not include uninsured and partially insured losses. The loss of life in farm fires is estimated 3,500 annually, and even the insurance companies don't attempt to set a figure on the number injured.

Figures that range into the hundreds of millions have a tendency to lose all meaning for anyone but a statistician. It is easier to comprehend the individual disasters that go to make up the total. Like the case of Allen Dillworth, where fire destroyed his barn, his whole hay crop, and three head of Jersey cows and put him back in debt just when he thought he was in the clear with the bank. Or the tragedy in Minnesota suffered by Raymond Laux and his wife who lost their three children when their house burned explosively while they were working in the barn.

The insurance figures do put the finger on the most common causes of fire, which helps in planning a defense against it.

They also give some assurance that the waste and tragedy of fire can be avoided when they point out that nine out of every ten fires could have been prevented.

Removing the Causes

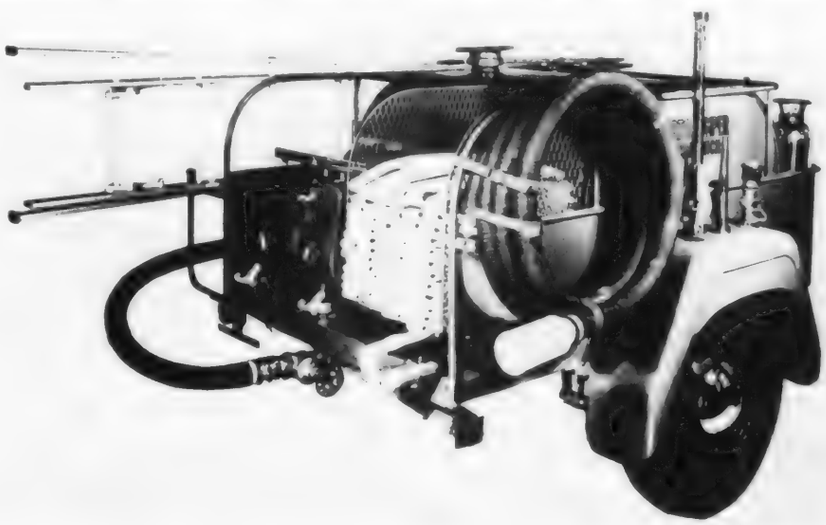
The way to prevent a fire is to eliminate the causes and to keep a constant check to see that they stay eliminated.

Following a check list of fire hazards will help catch all the fire dangers that must be done away with. Since Ben Franklin's experiments with lightning we have been learning how to use his lightning rod to protect our buildings. At one time lightning rods went out of fashion, were declared to be about as useful as an extra wart, but it is now known that rods, *if properly grounded*, will protect buildings against this most common of all causes of barn fires. If they are not grounded they offer no more protection than the cupola on the barn. But there are all kinds of rods, good, bad, and indifferent. One way to be sure that the rods will give absolute protection is to buy rods that are put out under the Master Label Service of Underwriters' Laboratories, Inc. This nonprofit laboratory has been organized to protect consumers, and will give its seal of approval only to manufacturers who produce reliable equipment; who submit to frequent factory inspection to assure that their product is kept up to standard; who train their personnel in the installation of the rods; and who submit a written report on each installation. Underwriters' Laboratories carry their inspection one step further on the Master Label Service; they send field men to spot check the installations against the written report.

Farmers can do their own checking by inspecting the conductors, the wires that carry the charge of electricity to the ground, to see that they are unbroken and properly grounded. They can also make sure that wire fences that are attached to

EMERGENCY FIRE FIGHTING EQUIPMENT is kept ready for use on this New Jersey farm. Fire fighting weapons, as well as all farm equipment that may be fire hazards, should bear the seal of approval of the Underwriters Laboratories.

A FARM-SIZED FIRE DEPARTMENT mounted on a trailer chassis carries a 200 gallon emergency tank, gasoline driven pump, 200 feet of fire hose, and fog nozzle.



THE CARBON DIOXIDE EXTINGUISHER can be used to fight gasoline and electric fire.

their buildings are grounded at the post nearest the building to protect both buildings and livestock.

Chimneys, stoves and furnaces should be checked in the fall to see that the flues are clean and uncracked; that the piping is undamaged and that it is securely fastened away from inflammable material. Spark arresters will cut down the hazards, especialy where roofs are covered with wood shingles.

Gasoline should be stored away from buildings. If large tanks are used they should be buried. Whether the tank is large or small, the gas should be pumped from the tank rather than drawn through a spigot, so that the gas will stop flowing in case of a fire.

"NO SMOKING" signs won't stop fires, but if they are posted in barns and the owner sees to it that they are obeyed, they will help reduce the hazard.

Spontaneous combustion in damp hay has caused a tremendous number of barn fires. Hay with more than 25 per cent moisture is in danger of both spoiling and firing the barn. Mowed hay should be checked periodically for hot spots until it is safely past the "curing" stage. One way to check is to lower a thermometer through a pipe driven into the hay. If, after being in the pipe for at least 15 minutes, the thermometer reads 158 degrees, the hay should be watched carefully; it has reached the danger point. If it reads 185 degrees, all ventilation should be stopped and the hay moved outside; if the hay cannot be moved, carbon dioxide, either from a fire extinguisher or in the form of dry ice, will help cool the hay and exclude oxygen. If the temperature is up to 212 degrees, call the fire department. Smouldering hay should be soaked with water and carefully removed from the barn. The hay should be handled with care since there is a danger that air might start a fire. When climbing over smouldering hay there is always the danger of falling into holes burned deep in the mow. Mow cured hay should be checked for several days after the fan has been turned off to see that it is not heating. At the first sign of heating, the fan should be started again. If the air is artificially heated in drying hay or other crops, the farmer would do well to secure equipment that has passed the Underwriters' Laboratories inspection and see to it that all precautions are observed when the machinery is used. This organization tests and inspects not only fire protection devices, but all equipment that might be a fire hazard, from brooder stoves and furnaces to electric motors and electric fences. The wise buyer will insist on equipment that has passed their tests.

A—B—C—Fires

Every fire must have three things to keep burning, heat, fuel, and oxygen. Fire fighters try to deny the fire one of these three needs and so put it out. Since gasoline and electricity have come to the farm there can be no one way to fight all fires. Water poured on a gasoline fire will cause it to spread rather than put it out; and if water is put on an electric fire, the person at the other end of the stream is likely to get a shock. Modern fire fighting equipment is tailored to fit the fire and both fires and the equipment that is used to fight them are listed by insurance companies into three classes, A, B, and C.

Class A Fires

All fires involving burning wood, paper, straw, hay, or trash fall into Class A. The best way to fight Class A fires is to reduce the temperature by pouring on water. A long, stout ladder, buckets of water, backpack sprayers, pump sprayers, and soda-acid extinguishers should be kept handy to put out this type of fire in its early stages. Underwriters' Laboratories recommend at least one two-and-one-half gallon sprayer for each 2500 square feet of floor space so located that a person doesn't have to run over 50 feet to it. Many more water buckets, which are less efficient, would be needed to give the same protection. If buckets are used, keep three or four of them nested together and sunk in a barrel filled with water. Each bucket is pulled out full and ready for use. Sacks and old blankets can also be kept in water filled barrels ready for use.

Contrary to popular belief, the chemicals in the soda-acid

(Continued on page 101)

THESE GOSLINGS, fresh out of the egg, are barnyard royalty worth $2.00 each. If the gander and his mate do a good job of rearing them, the youngsters may grow up to become powder puffs, pillows in their owner's bed room, or *pati de foie gras*. Geese are among the oldest of domesticated fowl. They are easy to raise, since they live by grazing for much of the year, and require little shelter even in winter. This pair may stay mated for life. In most commercial flocks, however, each gander has three mates.

THE GOOSE Is Coming Back

Commercial goose farmers have new ideas for raising more geese faster to meet the rapidly growing demand.

GEESE SUPPLY the highest priced feather product on the market. When dressed, 50 birds may yield 10 pounds of feathers and down, which sell to processors for about 80 cents a pound.

ANDY Kollar feeds his 2000 geese three tons of corn every ten days. "That's a lot of corn," says Kollar, "but a goose is a big eater."

Geese are only a sideline with Kollar. His 40 acre poultry farm near Barberton, Ohio, produces 1500 to 2000 ducks for market every week. Two years ago he decided to include a flock of geese, and not being one to do a thing half-way, he soon increased his flock to include enough birds to keep his poultry yards in an uproar.

Geese seldom whisper. They babble and honk day and night, weekdays and Sunday. This makes some of Kollar's neighbors unhappy. "I'm told," says Kollar, a friendly, middle-aged fellow who says that he has always been too busy with poultry to take time to get married, "that the neighbors are circulating a petition to make this neighborhood off limits for geese. Wonder what a farmer is supposed to do about his livestock making noise? I don't like to hear a cow bawl when her calf is taken away either, but there isn't much I can do about it."

Kollar will tell you that there are few animals, including a dog, that make better watch dogs than geese. A small flock of geese around the place can be depended on to awaken the household when a stranger crosses the property. Their voices are adequate to set up the alarm, and there is little chance that they will sleep through a stranger's visit, for geese seem to have chronic insomnia. The most famous instance of geese setting up the danger alarm was when the Gauls were creeping up on the walled city of Rome more than 2000 years ago. As the enemy approached, the sacred geese within the city sensed the danger. They set up such a clamor that the guards were aroused in time to beat back the invaders, and ever since the geese have been credited with saving Rome.

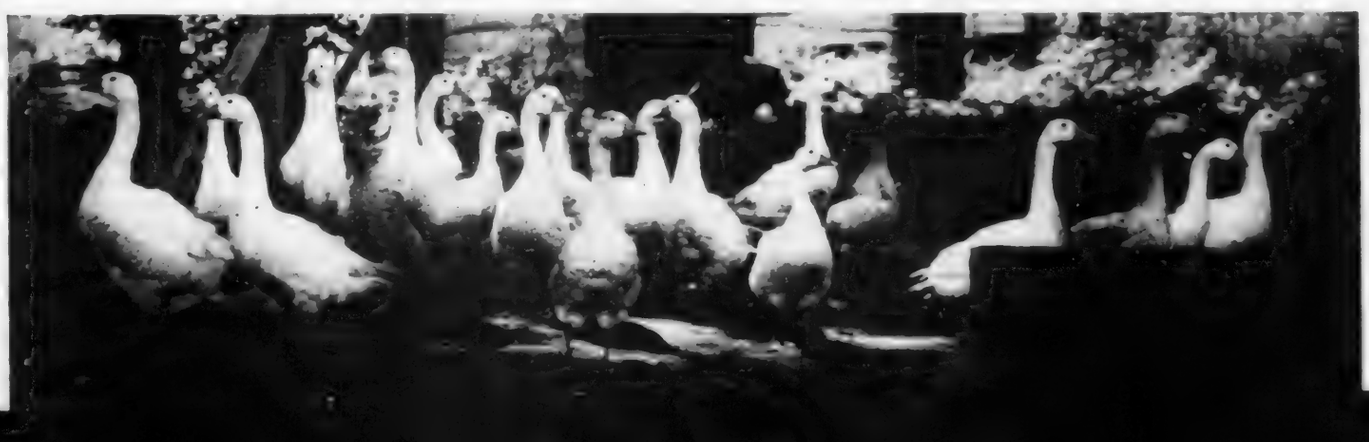
Kollar is only one of a number of poultrymen across the country who has, in recent years, taken a sudden new interest in the money making possibilities of the goose. The demand for geese has grown so fast that farmers want more than hatcheries can produce. Market prices are high and there is promise of a big boom in these big birds. As one hatcheryman summed it up, "The goose business today is just about where the chicken business was 30 years ago."

The goose has a time-honored place on the farm, both in this country and abroad. Until recently they have always been produced in small farm flocks of 10 to 50 birds. Each spring a few goslings hatched and were fattened for market. The old geese go right on breeding for 10 or 15 years and even longer, for geese have been known to live for 50 years. A few geese each year from many farms kept the market supplied. It was seldom glutted because geese have never been famous for their efficiency in reproduction.

Eating habits changed and there was less demand for geese. Then a decline set in. Fewer and fewer flocks were found on the farms. In the last ten years geese have become almost a rarity. But now that the birds are being raised in com-

(Continued on page 133)

MOST GEESE are still raised in small farm flocks. The owner can sell the eggs to a hatchery for about 30 cents each. A good goose lays 40 eggs a year.



SHALLOW PLACEMENT with a grain drill is best for small grains with roots near the surface.

Food Where Crops Need It

BY A. J. OHLROGGE

WHEN a farmer feeds his cow he has to put the feed within reach of her mouth. The same is true when he feeds his crops. If the roots can't get to the fertilizer it might just as well have been kept in the sack for all the good it does the crop.

Timing is another factor; a cow should have more feed when she is producing —a plant should have fertilizer at the right time. Farmers and scientists have been working for years to find how to use fertilizers to get the most value from the fertilizer used. Very often when a new method shows local promise it is heralded as the final answer for the whole country and for all crops. It is tried all over the country under conditions where it was never intended for use, and the poor returns too often discredit a method which may be selectively good.

There is no one method which will work with all crops on all soils during all seasons—but there is one general rule of fertilization which will work under all conditions. This rule is: Use the fertilizer in a form available to the plant and put it in the soil where the roots can get it when they need it. This blunt fact is too often forgotten in thinking about fertilizer placement.

To get anywhere on this problem of *where* to place the fertilizer we must know: (1) *when* a crop needs that extra boost from fertilizer, and (2) *how much* nitrogen, phosphones and potassium it will use. It is important to know this, because the shorter the time between correct application and uptake by the plant, the more efficiently will the fertilizer be used.

How Much

The following table shows us how much nitrogen, phosphonic acid, and potash various common crops use. These are average figures which may vary widely, depending on the conditions under which

a crop is grown, but they are very useful in arriving at a rule of thumb on crop needs.

Nutrient content of the above-ground portion of several farm crops

Crop	Yield	N	P_2O_5	K_2O
		lb.	lb.	lb.
Corn	100 bu.	140	45	120
Wheat	30 bu.	60	25	35
Oats	50 bu.	55	20	50
Barley	40 bu.	50	25	45
Soybeans	30 bu.	140	55	70
Alfalfa	3 tons	150	40	80
Red Clover	2 tons	90	25	60
Timothy	1.5 tons	45	15	50

From this table we see that the dairy farmer who hauls off the field the fodder and grain from a 100 bushel corn crop for silage is carrying off 140 pounds of nitrogen (N), 45 pounds of phosphonic acid (P_2O_5) and 120 pounds of potash (K_2O), or, in other words, the total amount of plant food in 1000 pounds of 14-5-12 fertilizer.

When

Now, when do the crops take up this plant food? J. D. Sayre, of the Ohio Experiment Station, harvested corn every three days beginning four weeks after the corn was planted. He found that only 118 pounds of dry matter were produced during the first month of the growing season, but that after the corn was a foot high it made rapid growth, reaching a maximum of 250 pounds of dry matter per day at tasselling time. After it reached this peak, dry matter production gradually fell off until it reached zero at maturity. The grain yield was at the rate of 124 bushels per acre.

Nitrogen and phosphones uptake, he found, is almost identical with dry matter production. Peak uptake for nitrogen was about three pounds per acre per day, or the amount of nitrogen in 100 pounds of 3-12-12 fertilizer. The peak for phosphones was a little over a pound a day.

The story on potash, however, is quite different from nitrogen, phosphones and dry matter. It reaches its peak uptake two weeks earlier and rapidly decreases to zero two weeks after tasselling. Not only that, but potash actually is moved out of the stalk into the roots, reaching a peak rate of over a pound per acre per day. The same thing happens with wheat, and probably also happens with the other cereals and grasses. As much as fifty per cent of the potash that was in the stems, leaves and heads of wheat just before tasselling moves back into the roots by the time the plant is mature. So we can readily see that it doesn't make much sense to apply K_2O at tasselling time for corn or wheat, but adding nitrogen and phosphones would seem to be a very sound practice.

Nitrogen and phosphones uptake in the cereal grain and grasses is very much like that of corn.

But all crops are not like corn. Jack Hester, of the Campbell Soup Co., performed the same type of experiment with tomatoes. He found that the nitrogen and phosphoric acid uptake and dry matter production are not unlike those for corn, but the story on potash is quite different. Potash uptake continues at a high rate through the period fruit is picked.

We don't know any cases where this same kind of test was carried out for legumes, but we can assume that they would be like tomatoes, with all three elements following dry matter production.

It stands to reason then, that the peak demand for plant food, during the tasselling or flowering period, is a critical time. The soil can release a variable amount of plant food each day, depending on how fertile that particular soil is. If the amount the soil releases doesn't equal the amount the crop needs, then that crop will be poorly nourished. In the Midwest it is during the last part of July and early August that corn fields begin to fire for lack of nitrogen. It is then that the corn is making its greatest demands for food, and the poorer soils cannot rise to the occasion. So to supplement the soil's supply, fertilizer is added, and we try to apply it properly, as near as possible to the peak demand as practical, in order to get the largest return from the fertilizer used.

Let's not forget, though, that in addition to this peak period of food demand by the plants, the first two or three weeks after planting are critical, too. Deficiency symptoms are more often seen at this time than later on. This period is critical because the young plant does not have a large root system to search out plant food in the soil. In some crops this limited root system has a hard job in meeting the small demand on even the most fertile soil. Of the three nutrients we have been discussing, phosphones are the ones whose deficiency is most often noticed.

When the farmer comes to the question of fertilizer placement then, he must fill two needs: (1) food for the young plant and (2) enough fertilizer to bring it to maturity.

Feeding the Young Plant

Starter fertilizer is fertilizer applied to help the young plant get along. To give the crop a strong early start, the closer the fertilizer is placed to the seed, the better. Placing the fertilizer in contact with the seed is a good method. Then as soon as the first root appears it will have all the available plant food it needs. This placement is fine for starter effect, but can't be used with all crops.

Some crops are fussy about how much soluble food their roots will live in. Of the commonly applied nutrients, potash is the one to which some plant roots are very sensitive. This is because it comes in the form of a soluble salt. Most of the legumes cannot stand much soluble salt around their germinating seeds. The small grains are not so sensitive, corn ranks halfway between the legumes and the small grains.

With the sensitive crops, some soil free of fertilizer should lie between the seed and fertilizer band. The actual amount necessary depends on how much is applied and the texture of the soil. The more clay and organic matter in the soil, the more salts it will absorb. A good average for most soils is about one to two inches. The band should also be an inch or two to the side of the seed—never directly above or below the seed. If it is above, the roots would have to grow up to reach the phosphones in the fertilizer, since phosphones do not move in the soil after they are applied. Rains would also wash the soluble salts down around the seed, endangering the germination and stands. Placing the fertilizer directly below the seed is almost as bad. If dry weather follows planting, the water in the soil moves up and is evaporated, carrying the soluble salts up around the seed. The effect is the same as placing the fertilizer with the seed, poor germination and stands where soluble salt-sensitive crops are being grown.

Equipment Available

Bill Edwards, who farms a hundred and sixty in Benton County, Indiana, takes a look at his corn planter to see where it is placing the fertilizer. He finds that his planter uses a dividing hood back of the planter shoe to place the fertilizer in bands on either side of the seed at the

PLOW SOLE PLACEMENT puts the fertilizer where corn can use it late in the growing season. Deep rooted legumes in the rotation will do the same job better.

same level as the seed, and with about an inch of fertilizer-free soil between the seed and the band. This is a good placement, although an inch deeper would be better for his crops. Seldom, when he uses this planter, does the fertilizer end up anywhere near seed level. In most cases it is placed near the surface of the ground. Edwards can locate at a glance every hill of corn on his neighbor's farm, because some of the fertilizer is lying on the surface of the ground. This is because his neighbor either sawed off a portion of his divider or else moved it up on the planter shoe as far as possible so that it would not catch trash and cause trouble during planting. Also, he often drives the planter at too high a speed, which pulls the planter shoe out of the ground and tends to give shallow placement. If Edwards and his neighbor keep those fertilizer hoods as far down as they'll go, they'll get better placement.

There's a lot of room for improvement on Edwards' equipment, in fact, there is on most of the fertilizer attachments on corn planters. When he decides to replace his planter, he'll be interested in a new planter on the market with separate fertilizer shoes. These shoes are adjustable for depth and look like they'll do a good job if used properly.

The drills Edwards uses for beets and beans and other special crops, provide for placing the fertilizer away from the seed where necessary. His grain drills with fertilizer attachment do a good job in placing the fertilizer in direct contact with the seed.

Placement for Mature Plants

Let's find out, now, how this equipment can be used for fertilizing for the second critical growth period. Can enough starter fertilizer be added to carry through this critical period?

On small grains, yes. On wheat, oats, and barley as much as 1000 pounds per acre of a 3-12-12 fertilizer can be applied safely with the seed. Such high rates will slow up the germination of the seed in some years, but the bad effects will not be serious. About 120 pounds of potash (K_2O) per acre when applied in seven inch drill rows is about as much as can safely be applied.

This placement is effective because it fulfills the requirements of effective fertilization; that is, available plant food where there are adsorbing roots, and when the plant needs it. These small grains grow in early summer when the ground is moist all the way to the surface, and the plants have roots near the surface.

The farmer seeds these small grains in the rotation with a legume mixture. The sod crops also maintain a good cover over the soil, keeping it moist, and they, too, have actively absorbing roots near the surface.

With intertilled crops such as corn and soybeans the story is different. When you walk into a corn field in July or August, and kick up an inch or two of soil, you seldom find many live roots near the surface. More often than not, the surface two inches will be bone dry. This means that if you want to feed the crop during this period, the fertilizer must be placed deeper in the soil where there are live feeding roots.

On many soils with properly fertilized rotations, only starter fertilizer will be needed on the corn crops. The amply fertilized small grains and legume sod crops in the rotation will maintain a high enough fertility level in the soil so that a starter will do the whole job.

But for a fellow like Jim Eckhart, who took over a worn out farm in southern Indiana, and is starting from scratch, extra fertilizer will be needed on his intertilled crops until he gets a good rotation underway. Jim would have to go through his rotation of well fertilized legume sod crops, at least twice before he could just use starter fertilizer alone on his corn. This means that for six or eight years he will have deficiency symptoms in his corn fields and will harvest low yields. The nitrogen deficiency symptoms, pale green leaves with yellow fired tips, so common in corn fields in late July and August mean that most of the corn is not growing in well fertilized rotation containing plenty of legume sod crops. These deficiency symptoms can only be corrected by feeding the crop during that period of peak demand in late July and August when the crop has used up most of the available plant food stored in the soil, and the rate of release of available plant food does not meet the crops demand.

If Eckhart's fertilizer attachment gets the fertilizer below seed level, then he can use it to add the extra phosphate and potash. But if the attachment places the fertilizer shallow, then he can place it deeper by planting the crop with furrow openers. In cultivation these furrows will be filled, and in late July and August the fertilizer bands will be three to four inches deep in good moist soil where the roots will feed upon it.

Deep Placement

Because the equipment available did not do the job, plowing under fertilizer, either broadcast on before plowing or applying it with an attachment on the plow, was introduced. It would have been better if this could have been applied at planting time, but the equipment to do this job has not yet been designed.

These methods for deep placements have several definite disadvantages. Broadcast application before plowing mixes the fertilizer with too much soil to get top efficiency. On most midwest soils the plow sole is quite acid, and applying the fertilizer there cuts down on the per cent uptake of the phospones by the plant. In both cases the fertilizer is being applied several weeks to months before the crop uses it. The attachments on the plow are a nuisance because of the small hopper, and the other methods mean an additional once-over the field to apply fertilizer.

On those fields which fire for nitrogen, side dressing comes into the picture. The nearer we can apply the nitrogen to the time it will be used, the better. Then there will be less time for soil bacteria to use the nitrogen.

Side dressing is excellent—if properly done. But remember, nitrogen must be where the live roots are. Shallow side

PLACEMENT is not as important with manure as with commercial fertilizer since the whole value of manure is not immediately released, but carries over for years.

THE FERTILIZER HOOD on the planter shoe should be set at maximum depth to deposit the starter fertilizer in bands beside the seed. Fast driving tends to pull the shoe and hood out of the ground.

dressings are effective if there is enough rain to wash the nitrogen down to the roots, but there is no need to gamble on the weather if the nitrogen is applied sufficiently deep to begin with. By using narrow knife-type shoes it can be placed four inches deep in the center of the corn rows at the last cultivation with good results. In the center of the row the equipment won't prune any roots, and with the knife type opener the root zone will not be seriously disturbed.

On C. V. Conder's farm, a black prairie soil on the Tippecanoe-White county line in Indiana, 30 pounds of nitrogen applied one to two inches deep at the last cultivation in the centers of the row increased corn yield 12 bushels per acre. When the same amount of nitrogen was applied four inches deep with a knife type shoe, he got a twenty bushel increase in yield. The same thing happened on the Homer Bramer farm on light-colored, clay ground, Fincastle silt loam. But on the C. H. Thompson farm near Rochester, Indiana, the shallow application was as good as the deeper application because Thompson had a sandy loam, and the well-distributed rainfall during the growing season washed the nitrogen down around the roots. At the Conder and Bramer farms, with their heavier soils, not as much nitrogen was able to reach the roots with the shallow placement.

Top dressing fertilizer is a common practice on some crops. Let's examine this placement.

On most soils winter wheat needs a little nitrogen as a starter to get the crop established. This is applied in the mixed fertilizer with the seed. But in spring on many soils the wheat turns light green, indicating that it needs more commercial nitrogen. Putting on the nitrogen broadcast to help stool out wheat is a good practise. The nitrogen is soluble, and with the roots near the surface of the moist soil, it is immediately available to the crop.

With permanent grass pastures we have the same situation, a lot of feeding roots near the surface with a lot of organic debris. Therefore, even phosphate top dressing is a good placement. But for the farmer who is renovating that pasture,

(Continued on page 136)

New Bees For Old

Thanks to science, the busy little bee is becoming still busier. Even the queen's sex life is not her own.

BEE keepers all over the world have their attention focused on a tiny island in Lake Erie, for on this speck of land the honey bee is being redesigned.

Bee keepers have always been inclined to accept the honey bee as nature gave it to them. After all, nature had done a good job on the bee and, in addition, controlled bee breeding seemed like a near impossibility. But the bee has its faults, and there has always been a place for a super bee if someone who understood such things could learn to breed bees selectively.

For one thing, bees have always come equipped with stingers which, coupled with nasty dispositions, can make them mean to handle. They also have a tongue which is too short to allow them to reach the nectar of certain valuable plants such as red clover. Some bees seem to be born lazy, and the increased production of a bee that would be willing to work overtime storing honey would be a boon to the bee keeper. Bee keepers would also like to find queens which would live longer than the normal average two-year life span. It was to search out the answers to these problems that Kelley's Island was made into an isolated bee laboratory.

Kelley's Island, which is four miles from the mainland and almost within sight of Sandusky, Ohio, is proving to be an ideal spot for breeding the super bee. Bee men all over the country can already foresee the day when most of our commercial bee stock will originate on this 2800 acre patch of land.

It was 12 years ago that a group of Ohio bee keepers formed the Honey Bee Improvement Cooperative Association. "The purpose," says Charles A. Reese, Extension bee man at Ohio State University, and prime mover in founding the Association, "was to develop better strains of honey bees."

Reese started talking with his fellow workers on the project about the best place to do the bee breeding research. It would have to be isolated so that no outside strains of bees could pollute the inbreeding experiments; in fact, it would have to be an island. Kelley's Island was the logical choice, for in addition to isolation, the island was ideal for honey production. There is on the island an almost constant succession of pollen and nectar plants from early spring until late fall. Farmers on the island point out that they cannot remember when there has been a killing frost before the first of November. Rainfall is less on the island than on the mainland because many of the storms on the mainland never cross the lake. This gives the bees more working hours. What surprises many commercial bee breeders is that some one didn't think of the island a long time ago as a fine commercial honey producing location.

The next step in the Association's plan was to enlist the help of the bee scientists in the country. They knew that the only two bee geneticists in the world were Dr. Otto Mackensen, and Dr. W. C. Roberts, both with the USDA. So, the Ohio Bee Improvement Cooperative Association teamed up with the USDA in their plan to develop new strains of hybrid bees. Now the research being done on Kelley's Island is directed by Mackensen and Roberts, while the Ohio group supplies the equipment and conducts the business of distributing newly-developed hybrid queens to bee men.

The new style bees look like any other honey bee; the size and shape are the same. Eventually bee scientists hope that the hybrid bees will come equipped with longer tongues to enable them to get deeper

NEW HYBRID BEES will have better dispositions than their old style relatives.

into certain flowers which are now beyond their reach. They are already more resistant to foulbrood and other bee diseases than are the naturally mated bees, and they have a more gentle disposition. Their main difference, however, is one which can be seen in the honey and not the bee; the hybrid bees are producing more honey by making more and longer trips during the day to pollen and nectar sources.

When the bee specialists moved to Kelley's Island they found only two local farmers who were keeping bees. The farmers sold their few hives to the Association, and the Association replaced them with hives of their own choosing, moved to the island from the mainland.

It was not a difficult problem to destroy all the old strains of bees on the island since all remaining drones die in the autumn. During the early spring the queen in each of the new hives was removed and replaced with an artificially inseminated queen. When the breeding season came the following summer, every bee hatched on Kelley's Island was of known parentage.

Now with the combination of isolation and the known lines of bees on the island, the project was ready to get underway.

There was still one point to be carefully determined. Although the island was separated from the mainland by four miles of water, it was just possible that wind might carry bees over from the south shore of Lake Erie. There was a way to check this. During the height of the breeding season all the drone bees were taken from the experimental hives. Matings dropped to zero. When the drones were replaced in their hives, matings climbed back to normal. This check was run during two successive summers with identical results. It was evident that no bees were coming across the stretch of water. This ruled out the need for mechanical or artificial insemination of qneens on the island for inbreeding since the isolation provides 100 per cent control over natural matings.

The colonies on the island are now headed by sister queens all of which are hybrids of two selected inbred lines. They have been especially selected for honey production and disease resistance. Four different strains of hybrid queens are being produced and each is a hybrid of other unrelated, inbred lines.

The first crop of 1200 cross-bred queens was shipped from Kelley's Island in the summer of 1948. In 1949 production climbed to 2000 queens. It was no task to find commercial bee keepers willing to test these new style queens in their apiaries. In fact, the Association had to turn down a whole stack of requests.

Bee keepers interested in working with the hybrid stock can apply to the Honey Bee Improvement Cooperative Association at the Ohio State University in Columbus, Ohio. The first requirement is that they have in production 50 or more colonies of bees. They order the queens in groups of 25 and pay $1.75 each for them. In 1948 and 1949, the queens were shipped to applicants with the understanding that they would report back to the Association on performance. The bee breeders then used this information to help them decide which strains of bees to develop further and what new crosses they should make to bring out the qualities they wanted to breed into their new hybrid stock.

As the primary experimental work progresses, and the bee scientists of Kelley's Island know which queens give the best performance, the hybrid queens will be sold to organizations that make a business of supplying bee keepers with queens. Most of the package bees are produced in the gulf area of the Southern states. These queen breeders are anxious to start production of hybrid stock as soon as the Association releases the seed stock for commercial production.

The Honey Bee Improvement Cooperative Association is now ready to make its queens available to breeders. The preliminary tests have proved successful enough to justify distribution and the first of the Kelley's Island stock will go out to commercial breeders by June of 1950. These queens, instrument inseminated, will be available to bonafide, established queen breeders.

The bee breeding specialists started their program with ordinary bees of various lines such as Italians, Caucasians, and Carnolians. Virgin queens of these lines will, if treated with carbon dioxide, lay eggs which hatch into drones. With the aid of artificial insemination the drones are inbred to the mother queens in each of these lines. This inbreeding is carried on for several generations and in each generation the scientists weed out those bees which show freakish size, shape or coloring, leaving only a growing number of highly inbred bees.

Eventually the bee scientists have highly inbred groups of bees descended from each of the breeds with which they originally started. Queens of one inbred group are then crossed with drones of an entirely different inbred group, again by artificial insemination, and the resulting offspring is a two-way hybrid. These first cross hybrids are the ones that will be sent to commercial queen breeders. Before the queens leave Kelley's Island they will have been natu-

(Continued on page 137)

THIS IS THE TOOL which is changing the queen bee's on-the-wing mating to a laboratory procedure. She is anesthesized with carbon dioxide gas and inserted, head first, in a glass funnel. Tiny steel hooks hold her in position, while the semen-filled, glass tube is manipulated by the technician. By this method lines of bees can be inbred and eventually two strains can be crossed to develop hybrid vigor.

The Forage Harvester

The forage harvester takes the back breaking labor out of haying and silage making. On most farms it is the cheapest way to harvest hay.

BIG BILL REDMOND used to regale the hay crew, as they rested during lunch hour, with the marvels of the new combine which he had seen in the wheat fields of Kansas. This wonder machine, he claimed, cut a ten foot swath of wheat on one side, threshed it, blew out the straw, and dropped out sacks of flour and bran at the other end. "But that is only the small one," he'd say, "the big machines do all that too, but they deliver fresh baked bread and cake instead of flour." If Bill had loosed his imagination on the job of making hay those 30 years ago, he probably would have described something like our present day forage harvester, a machine that makes it possible for three or four men to put up a bigger crop than Bill and 11 other men could do in the old pitchfork days.

The forage harvester is a new machine as farm machines go, and it is still finding its place on American farms. The farmer who contemplates the purchase of one is faced with three questions: (1) Will it save me time and labor? (2) Will it give me better and more feed? and (3) Can I afford it?

Since a forage crop may be harvested in several different ways, he will want to know the answers to these three questions as they apply to his own method, whether it is field drying, drying in the barn or haymaker, ensiling, or pasturing the crop.

Time and Labor

Where hay is cured in the field, the forage harvester comes into the picture after the hay has been cut, cured and windrowed. The harvester, with a windrow pickup, gathers the hay, chops it and blows it into a trailing wagon. As the wagon is filled, it is replaced by an empty and pulled to the barn where the hay is unloaded into a blower or farm elevator which delivers the hay into the mow. Most farmers are equipping their wagons with automatic unloaders to cut down on the labor requirements at this end of the job. Farmers usually use a three-man crew on this operation, one on the tractor that pulls the harvester, one on the tractor that changes wagons, and one to tend the unloader and blower. The wagon driver often helps with unloading between trips.

But using a forage harvester is only one of several methods a farmer may use to pick up the hay and get it to the barn after it has been cut and windrowed. If the addition of the harvester to his already expensive haymaking equipment doesn't save him time, money or hay, the farmer would be foolish to invest in one. To find out which of these methods was the fastest, F. W. Duffee and H. D. Bruhn, of the University of Wisconsin, gathered time study figures from several different areas showing the number of man hours required to move a ton of hay from the windrow into the

WITH A PICKUP ATTACHMENT, the forage harvester gathers the hay from the windrow. Cured hay is ready to be blown into the mow; semi-cured hay is artificially dried.

THE COVER GIRL on this issue of *The Farm Quarterly* works with her father and husband unloading chopped corn into the blower. With a mechanical unloader one of them could do the job with the occasional help of the wagon driver.

THREE MEN AND A HORSE were required to mow the hay in the old days. Now one man with an unloading attachment on the wagon and blower can do the work.

barn. They found that the average time for the different methods was as follows: using a loader and hay fork or slings, 2 hours 24 minutes; with a one-man baler, 1 hour 54 minutes; with a buck rake, 1 hour 42 minutes; and with a forage harvester and blower, 1 hour 36 minutes. When these figures are applied to the farm it means that harvesting the hay from a 50-acre field that produces two and a half tons to the acre, costs the farmer 300 man-hours with a loader and hay fork or slings; 237½ hours with a one-man baler; 212½ hours with a buck rake; or 200 hours with a forage harvester. If labor is figured at 75 cents an hour, he would be spending $75.00 more on labor with the loader; $28.02 more with the baler; and $9.38 more with the buck rake for his labor than he would with the forage harvester.

Gus Schaeffer, like most farmers, scorns stop watch timing when he is making hay, but he has a very good idea what he can do with his harvester. He and his son Art do the entire hay job themselves which, they concede, is not the most economical way to use the equipment. One of them cuts and rakes the hay in the morning while the other is cultivating corn or doing some other job. In the afternoon one of them drives the harvester and the other a dump truck. At the end of each load they both go into the barn and blow the hay into the mow. "With an extra man," Schaeffer admits, "we could do twice the work by keeping the harvester working continuously, but, even so, we have cut and put away four acres of hay in a day. At the end of the year, when I was figuring out my income tax I found that we had only spent $85.00 for extra help during the whole year and that wasn't on haying.

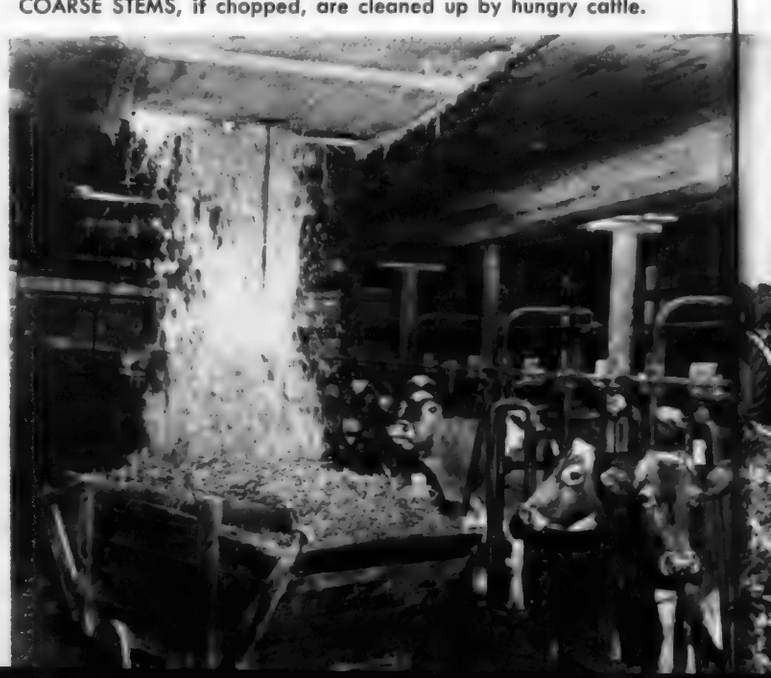
"Another thing that Art and I like about using a harvester the way we do," Schaeffer continued, "is that if the hay gets rained on we only have a small part of it cut at any time and so don't lose the whole crop."

"Sure you save money on labor," the farmer is bound to say, "but those machines don't run on air and you have a lot of money tied up in them." The answer for this statement comes from Minnesota where workers compiled the cost per ton of hay put up by a one man baler and a forage harvester. In each case they figured in the cost of depreciation of the machine for a 10-year period. They found that the cost per ton was $2.65 for the harvester and $2.98 for the baler on a 100-ton operation; $1.85 for the harvester and $2.50 for the baler on 200 tons; and $1.33 and $2.20 on a 500-ton crop. In California it was found that handling loose hay with a buck rake and stacker was cheaper than either the baler or harvester up to 500 tons a year, but that the forage harvester was the cheapest method when the crop went above that figure.

The advantages of storing chopped hay or straw are summed up by William Brandner of Spring Valley, Illinois, who began using a forage harvester last year and makes it serve an extra purpose by picking up and chopping the straw he uses for bedding in his dairy barn. "The mow holds more," he says, "and it's much easier to dig out. The straw is much easier on the manure loader and spreader too. Another advantage is that with chopped hay you naturally feed some from all three cuttings every time you pull it out of the mow. That way

STANDING HAY is cut and chopped for making grass silage.

COARSE STEMS, if chopped, are cleaned up by hungry cattle.



GRANDDADDY OF THE FORAGE HARVESTERS was this pick-up hay chopper made by mounting a Fox silo filler on wheels and adding a McCormick-Deering hay loader.

you mix in the poorer hay with the best and never run into a time when you have only poor hay to feed."

Chopped hay requires less than half the storage space of loose hay, but because chopped hay packs tighter it is necessary to store it a little dryer than long hay to prevent spoilage or spontaneous combustion. Long hay may have a moisture content as high as 25 per cent whereas chopped hay should be 22 per cent or below.

Beside saving space in the barn, the compactness of the chopped hay has another advantage. In the semi-humid middle west, where long hay (except pure timothy) cannot be successfully stored in stacks, the chopped hay can be blown into stacks and will not be affected by rain. The stack is formed by blowing the chopped hay into the stack area circled by snow fencing which keeps the sides straight. The top must be carefully rounded off to prevent the forming of pockets which will catch water and cause spoilage.

When hay is cured in the mow or in the steel haymaker, it must still be picked up from the windrow, hauled to the barn and put in the building. This is the same operation that is performed on the field cured hay and the time and cost figures given for that job hold good here. Farmers find, however, that the chopped hay can be spread more evenly over the air ducts in the barn than long hay when they are mow curing, and this probably saves them some time and money on the drying process. When they are using a steel haymaker the compactness of the chopped hay becomes important. With their investment in the building it would be wasteful to use it for long hay when they can dry over twice the amount of chopped hay in the same space.

It is in making grass or corn silage that the forage harvester reaches its peak of efficiency in saving time and labor. In putting up silage the crop must be chopped to get the tightest packing and exclude the air. The harvester with its pick up, chopping, and loading action has a distinct advantage over the other

(Continued on page 96)

CORN IS CUT AND CHOPPED for silage in one economical operation.

A MOVABLE CANVAS floor is used on this wagon unloader.

A MATURE HOG DOG will weigh 65 pounds, which he uses well in a fight. He has blue eyes and is spotted like a leopard.

HOG DOG

BY SAM MIMS

The Catahoula Hog Dog is descended from dogs brought in by the Spanish. He is the only dog trained to herd hogs.

DOWN in Louisiana where Catahoula Lake spreads out like a sleeping octopus there are no dogs for sale. Although this region has been the home of the Catahoula hog dog for more than a century, there is no one in that area who would offer to buy or sell a dog. "The Bible speaks agin it," they say.

Doc Pugh, who lives on the banks of the Catahoula, is proud of being the owner of Burt, but he didn't buy her. "I'd ruther have Burt in the swamps with me than half a dozen men; that is when I'm working with wild hogs, I mean."

Doc Pugh is good-natured, but he was annoyed when a stranger asked him about Burt. "Since Burt is the first hog dog you ever owned, Doc, where did you get her and how much did she cost?"

Doc bit hard on his cud of tobacco. "I swapped the best saddle horse in this country for her. That's what I done, but I never bought her. Was offered one hundred and fifty dollars for the horse, but I wanted Burt." Then, after a moment, he added, "Nobody ought-a buy or sell a dog. I wouldn't buy or sell a dog, not for no amount of money. It's bad luck and it ain't religious. The Bible speaks agin it."

Doc's wife brought out the family Bible. "Here it is," she said, pointing to the 18th verse of 23 Deuteronomy. "Thou shalt not," she read, "bring the hire of a whore, or the price of a dog into the house..."

A Hog Dog, Born and Bred

The Catahoula dog is bred and trained to handle the wild hogs of the swamps. These hogs roam at will through the unfenced swamps, picking up a scanty ration and growing up with a gaunt and bony frame and the disposition of an angry buzz saw. They become wild and ferocious and take to the inaccessible depths of the swamps when man enters their domain. Ownership is tenuous, but seasonally the hogs are herded and sent to feeders or market. The only way they can be captured is with the help of the hog dog, who knows his job and performs it with almost unbelievable cleverness.

The best time to corral the hogs is during high water when the swamp streams overflow. As the waters cover the low parts of the swamps, the hogs retreat to higher and higher ground, finally taking refuge on the ridges and hummocks. Here the owner builds a pen and sends his dog out to round up the hogs and to lure them into the trap.

The pen, ten feet wide and thirty feet long, has two partitions which divide the overall structure into three compartments of equal size, each partition having a small door to permit passage from one compartment to the other. At one end is the entrance with a door which is closed once the hogs are inside. Inside the third compartment opposite the entrance, a series of steps leads to the top of the wall, providing an exit for the dog.

From each corner of the pen a brush fence fans out seventy feet on each side. These fences, called wings, are about sixty feet apart at the open ends and the fence is made of brush, vines and limbs, camouflaged to blend into the swamp growth. This gives the hogs a feeling of security as they innocently advance toward the pen and they also furnish places of concealment for the man who is waiting to close the door after the hogs have followed the dog into the pen.

While the pen is being built, the dog is busy. With nose in the air he has circled the swamps, winding the hogs. He makes vicious attacks on singles and small groups, drawing them together. When he has them assembled, he goes into his act. He singles out the oldest boars and sows, making them charge viciously at him, white foam frecking their tusks, hair standing stiffly along the top of their necks. The younger hogs follow their leaders. Every time the old boars and sows rush at the dog they are that much

nearer the pen, which may be several miles from where they are first assembled.

Out there, deep in the scrub, the dog works constantly and persistently, conscious of the task before him. He must at all times remember the precise location of the pen, otherwise he might spend the day leading the hogs in the wrong direction, or perhaps in a circle, an error his master would likely commit.

As time passes the hogs begin to lose their fear. They seem to be hypnotized into accepting the dog as their leader and are willing enough to follow him. He leads them to the pen. Here the dog knows what to do. From previous experience he knows he must lead the hogs through the entrance door, through the partition doors and then he himself can mount the steps and escape over the top of the pen. To save him from the sharp tusks of the hogs, he must remember to scale those steps, a thing the hogs will not do and cannot easily do on their cloven feet.

The dog does not rely wholly on instinct. He has intelligence and he uses it. Hogs follow a general pattern of behavior, but circumstances may alter the pattern. During the march of the strange procession, a few pigs may become interested in acorns along the way, or may get a whiff of juicy grubs burrowing in the topsoil. These become laggards and threaten to disorganize the compact group. To correct this, the dog must, without halting the march and with great speed, sweep a circle, get behind the drove, and nip the laggards to show them that he means business.

When the dog and his followers arrive at the wing tips and are slowly approaching the open door at the end of the pen, the hogs are likely to become suspicious. The old boars stop, explore the air for a whiff of man, and get set to bolt at the least sign of danger. They snap their teeth, growl, grunt and squeal.

But the dog knows what to do. There isn't a second to waste after the hogs sense they are being led into a trap. He rushes upon one of the old boars and grabs an ear. A frantic squeal follows, and every pig, from the smallest to the largest, instantly becomes a warrior, charging at the dog, determined to tear him apart.

The dog darts into the open door of the pen. Here he pretends for a moment that he is going to stand his ground or that he is in a perilous situation. He may dart back through the door and grab another ear. The hogs make a concerted rush into the pen. The door is slammed shut and the job is done. The tired dog mounts the steps and jumps to the ground. "That's the best dam dog in America," says his master.

Occasionally the pen will be built on a scow, which is pushed against the bank and the wings are extended on each side along the bank. This permits a quick change from one assembly point to another and the hogs are already loaded for the trip out when they are captured.

Glass Eyes and Leopard Spots

The Catahoula hog dog, a local name for the breed, is also called "Glass-eyed dog," "Blue Leopard dog," or "Leopard dog." A Texan, who got his breeding stock in trade from the Catahoula Lake area, advertises them as "Leopard dogs." The price this Texas kennel charges for

(Continued on page 127)

THE HOG DOG knows to a hair how close he can get to an angry swamp boar. Hogs are the most difficult of all livestock to handle for they can inflict damage and are themselves almost immune. The Hog Dog has developed a sharp sense of swine psychology.

BREEDS OF SHEEP

BY J. F. WALKER

When breeders started working on new types of sheep, they didn't know when to stop. Now there is a breed for everybody—almost.

THE world is filled with so many breeds of sheep that both farmers and sheep have trouble telling them apart. Within the past two centuries dozens of new breeds or strains of sheep have been developed by sheep breeders to satisfy a need or fancy.

Today practically any farmer, any place in the world, can find a sheep to fit his needs. If he is already raising sheep he wants to know if he is working with the proper breed, and if he is thinking of starting a flock, he wants to get the right breed at the beginning. The breed of sheep he chooses would depend on (1) whether he plans primarily to produce wool or meat, (2) his farm and the climate, (3) whether he wants to keep pure blood or crossbred animals. The better he knows the different breeds, the more wisely he can make his decision; and to know the breeds of sheep he should know how they have changed down through the years, and what strains of blood went into each breed during its development.

Sheep have always played an important part in man's welfare. Originally, they furnished milk and wool rather than meat, and efforts to improve them were along those lines. However, when one considers the fact that ancient flocks were large and migratory and generally left to fend for themselves, it is not surprising that little was accomplished in developing better breeds until modern times.

The records tell us little about the character of the early sheep. About all that is known is that they were brown or black and had horns. The first account available of selective breeding of sheep appears in the book of Genesis. Jacob was given the spotted and ring-striped sheep and cattle by his father-in-law Laban and succeeded in modifying the color.

Those early breeds of sheep were classified according to their

tails. There were long tailed, short tailed, and medium tailed sheep. The short tailed breed had almost no tail. The long tailed sheep, by contrast, had tails so large that small carts were often attached to the sheep to keep the tail off the ground. The sheep of medium length tail were similar to our present breeds, and from them our modern sheep have descended.

The original sheep had two coats and he wore them both at the same time. One was a long wiry outer coat and the other a short fine, dense, inner coat.

The short inner coat was better for making cloth. Probably the first efforts to establish a distinct breed of sheep was direced toward the elimination of the outer coat, as in Georgia, a province of Russia. There, along the shores of the Black Sea, sheep early became noted for their superior fleece.

Talk about these sheep reached the ears of the Greeks, and the story of the Argonautic expedition, under Jason, in search of the "Golden Fleece", while somewhat embellished, doubtless had a foundation in fact.

The Greeks bred the Georgian sheep for the production of finer fleeces. The wool was anointed with oil and the sheep covered with skins to protect the fleece. They were kept sheltered during the day and driven out to the fields in the cool of the evening to collect the dew.

Some of these sheep were sent to Tartenia, a province of Italy, then across the Mediterranean into North Africa. When the Moors invaded Spain and took over Granada, they took their sheep with them, the forefathers of our present Merinos.

To the Moors we owe much of the excellence of the wool of this breed. The name "Merino" means "traveler" and the breed has lived up to its name. No breed has made a wider contribution to sheep husbandry the world over. Not only is this true when it is kept in its purity, but also through the introduction of its blood into other breeds.

Merino. Most of the improvement in sheep has taken place during the past 150 years. This improvement resulted from the wide use of three breeds, the Merino, Southdown, and Leicester. The Merino has been so modified that it has been made into several almost distinct breeds whose only common character is the quality of the fleece, and even that has changed. On the one hand there is the extremely fine short Saxony, shearing three to four pounds of super fine wool and on the other the robust Australian Merino, with a fleece long in staple and shearing 10 to 15 pounds.

No other breed has shown as much variation in type as the Merino. Various families have been created within the breed, each having its followers among the world's farmers. At one time as many as 20 Merino record associations were active in the United States, each featuring some particular type. Some were breeding extremely wrinkly sheep whose folds covered the entire body, shearing dense, heavy, short stapled, fine wool. On the other extreme was a perfectly plain bodied animal carrying a more open, longer stapled fleece.

The wrinkly sheep were called Vermont Merinos as that state was the great breeding ground for the type. The plain bodied type were called Delaine Merinos, a name derived from a type of cloth that required a long stapled wool.

While essentially a wool producing animal, the Merino has other qualities which have served to expand the sheep industry over the world. The breed is extremely hardy and able to live on a wide variety of plants. Its hard hoof allows it to range widely and be flocked in large bands. These qualities have made it the backbone of the range sheep industry in all the major growing areas in the world.

The Rambouillet, a Merino, developed in France, is at present a favorite due largely to its larger size and somewhat better carcass. The Rambouillet ewe will weigh 150 pounds and upward and the ram will weigh 200 to 250 pounds. Fleece weights are from 10 to 12 pounds in the ewes and 18 to 25 pounds in the rams.

In appearance it is a typical smooth type Merino. The males are horned, have white faces, and caps of wool to the eyes or below; the fleece is dense and two to three inches in length. While still quite popular in the range sections, it is more and more being superseded by crossbred animals. The same is true of the Merino, whose main popularity was in the Middlewest. There is a movement to improve the carcass on these fine wool breeds which may bring them back into public esteem. It is unfortunate that the need for recognizing the trend towards mutton production was not perceived earlier, for the competition of synthetic fibers, that are already replacing wool, have relegated the function of wool production to a poor second place; breeding in the future will stress meat.

Leicester. Although rare in this country, the Leicester is one of the three major breeds of the world for it has played a major role in the development of many of our modern breeds.

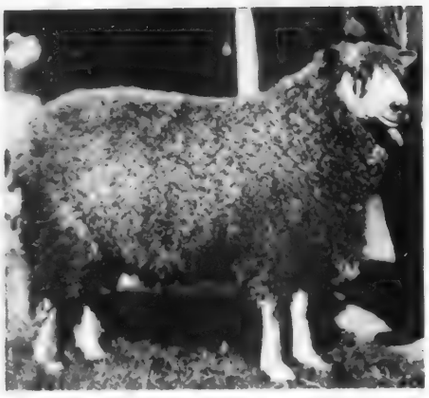
The original sheep of Leicestershire, England, were large, heavy sheep, with no horns, and a long thin carcass with a coarse grained meat of poor quality. The fleece measured from 10 to 15 inches and weighed from 8 to 15 pounds.

This was the animal on which Robert Bakewell started his famous breeding experiments about 1755. He wanted to produce an animal that would better serve the needs of the times.

Bakewell's success was so outstanding that he has gone down in history as one of the master breeders of all times. His methods have been followed in perfecting most of our modern breeds. Bakewell was secretive in his formula for developing a

THE HAMPSHIRE, a major mutton producer in the West, contributes blood to crossbred ewes sent East for early lamb production.

THE MERINO won fame as a wool producer. Breeders are now improving the carcass, and the Merino may have a bright future.



THE LINCOLN, a long haired breed, is used for crossing with ewes of fine wool blood.

better sheep. Whether he confined his work to selections within the original breed or resorted to outside blood is not definitely known. It is known that he worked to produce a faster maturing, finer boned, better fleshed animal with better quality meat. When he produced individuals approaching his ideal, he started inbreeding to more firmly fix the type.

It was not long before his flock became famous and the animals were widely used in the improvement of other breeds, including the Lincoln, Cotswold, Border Leicester, Romney, Ryeland, Wensleydale, Devon Long Wool, and later the Corriedale in New Zealand and Australia, the Cheviot in England, and the Dishley Merino in France.

Southdown. The third breed to have a marked influence in the development of our present-day breeds was the Southdown. John Ellman, an Englishman, was the man responsible for the development of this breed.

The sheep of the South Downs of England, a range of chalk hills bordering the English Channel, producing short, sweet grasses, were early described as "small in size, long and thin in the neck, high on the shoulders, low behind, high on the loins, down on the rumps, the tail set on very low, perpendicular from the hip bones, sharp on the back, the ribs flat, narrow in the forequarters but good in the leg although having big bone." Such was Mr. Ellman's description of the breed when he started his work about 1778. This native breed had ranged on the Downs for a long time and their origin is not known.

In color the breed was black in the face with a white tuft of wool on the top of the head; the legs were spotted or speckled, and frequently black lambs were born. The rams frequently had horns and the the wool was harsh and brittle.

While it is said that the improvement in the Southdown was made entirely from selection within the breed, there is some evidence that a bit of Merino blood got into the breed. Ellman had a large flock of sheep, around 1500 head. He also had Merinos and it appeared to be a common practice to cross Southdown rams with Merino ewes.

While black is a dominant color, within 10 years after Ellman started on his improvement program his sheep became speckled faced with an occasional white faced one and the weight of wool was increased and changed in character, becoming longer and less brittle.

A remarkable change in body conformation followed. Under his skillful breeding Ellman's sheep became noted as having the best forms of any breed and were widely used in the improvement of other mutton breeds in England.

England has produced more different breeds of sheep than any other country. At present some 30 different breeds are recognized as purebreds, about twice the number found in the United States. Nearly all of these breeds are localized and have been developed to meet local environments either in climate, feed conditions or market demands.

Wiltshire Horn. Some sheep are bred only for mutton. An extreme case is the Wiltshire Horn, which has practically no wool but is covered with a thick matted coat of hair. This breed is used for cross-breeding, the cross producing high quality meat and an extremely high dressing percentage. They are said to dress from 56 to 60 percent; the champion carcasses at the International Livestock Exposition at Chicago rarely reach the 56 percent mark. Another breed is the black faced Highland, a horned breed that produces a long hairy coat of wool and is found in the north of England and the Scottish highlands. Extreme hardiness and fine quality of mutton are the leading features of this breed. The fleece, unfit for cloth manufacture, is of carpet type weighing around six pounds. A very few of this breed have been imported into this country. For some years a small flock was kept by Charles Stuckey of Mechanicsburg, Ohio.

Welsh Mountain. This is another English breed favored primarily for mutton. It is a small sheep whose quality of mutton is said to be of the finest. In numbers, the Welsh Mountain ranks in the top three breeds. These sheep live almost entirely on grass. One farmer reports that in times of severe storms when grass is impossible to get, he has had sheep starve even though they could get hay and grain. The Welsh Mountain ranges in a district where an annual rainfall of over 100 inches is common. The fleece is short, fine and dense and weighs only two to three pounds.

Cheviot. This is one of the breeds of hill sheep found in north England. There is some question about the origin of the Cheviot. The story goes that they originally came down from Scotland, but as far back as history records, a white faced breed of sheep has roamed the Cheviot Hills. This breed was hornless and carried a thick fleece of short, fine wool. Later an infusion of Leicester was made to hasten maturity and increase the size. The Cheviot is a handsome, alert sheep, very hardy and active, and has long been known in America, although never attaining the popularity of some other breeds. The breed could well be used more extensively in our hill and mountain sections of the East than it now is.

Most Popular English Breeds

Mention has been made of the South-

THE SHROPSHIRE is a leading mutton breed of the corn belt. This breed, of uncertain origin, once sported a black face.

THE TARGEE is a newcomer in the sheep world. It is being developed by the USDA and its capabilities are still not known.

down and today it still represents the ideal mutton form. The breed has been refined since Ellman's day, more covering of wool added, and size reduced. Whether this is an improvement is questionable, but for crossbreeding for market lambs the breed still is supreme.

Shropshire. The Shropshire was one of the first of the English mutton breeds to attain wide popularity and in the corn belt area of the United States it is still the leading breed. The origin of this popular breed, some 100 years ago, is not definitely known. Some four different breeds were common in the section from which it originated. The more commonly accepted foundation was the Morfe Common, a small sheep closely related to the Ryeland. Later, Leicester and Cotswold rams were introduced, followed by Southdowns. Through selection and inbreeding, the Shropshire was produced and about 100 years ago became recognized as a distinct breed.

As originally imported into this country the Shropshire was a black faced sheep with a cap of wool over its eyes, legs bare below the knees, and carrying a fairly heavy fleece. The ewes weighed over 200 pounds and the rams from 250 to 300 pounds. The standard of excellence adopted in 1884 called for ewes to weigh not less than 175 pounds and rams 225 pounds in fair condition.

The breed found immediate favor in the Midwest, where the Shropshire rams were crossed with Merino ewes. Then came the demand from show fanciers for "more finish", meaning more wool on face and legs. The English breeders, always alert to export demands, met this by using Rambouillet rams and soon the Shropshire assumed the type now common. Present breeding practices are to avoid extremes in covering and to place more emphasis on carcass and size. Reference was made earlier to the three breeds responsible for most of our present popular ones, and in the Shropshire one finds the influence of all three.

Hampshire. Hampshires are the domi-

(Continued on page 129)

THE SOUTHDOWN, which was first improved in 1778 by John Ellman, an Englishman, has developed into three distinct breeds. The origin of the breed is unknown.

THE NAVAJO, still raised by the Navajo Indians on the barren desserts of the Southwest, is a hardy, hornless, sheep producing poor grade wool and second rate mutton.

THE DORSET, long popular in this country because of its early lambing, is hardy, medium sized, and has a good mutton carcass.

THE LEICESTER, rarely grown in America, is a major breed in the world line-up. Many modern breeds include it in the family tree.

THE BORDERS TREATMENT

Trace Minerals, a ten year rotation, and sound soil management have combined to produce a fabulous yield of grass and hay on a Kentucky dairy farm.

NINE tons of alfalfa per acre is a lot of alfalfa in one year, and in the bale. Most good farmers would be happy with half that, which was about what Forrest Borders, Bowling Green, Kentucky, was getting off his fields five years ago. He wasn't satisfied, and he's not satisfied with nine; he thinks he can go higher.

The story of Borders' hay and pasture crops began several years ago when a number of calves with scaly necks appeared in his herd. He called in the veterinarians. Some said they had lice, some said they had the mange. Borders was skeptical. He sent a carcass to a laboratory and word came back that they showed ascorbic acid deficiency. When he tracked this down he found that this might mean a cobalt deficiency, for cobalt is important in the production of vitamin B_{12}.

This led him to a quantitative analysis of the soil on his entire farm, and launched

THE BUBBLING BORDERS waves aloft fourth-cutting alfalfa from a field which made nine tons to the acre. "Thin stems; and leaves all the way to the crown," he says.

him into a program of fertilization, crop rotation, and animal management which has made his farm the mecca for soil scientists and farmers. He is one of the first farmers to approach animal and plant health scientifically by way of the trace elements; he has taken this controversial and vague subject out of the laboratories and brought it to his own fields and made it work. When the soil scientists and nutritionists could not answer his questions, he substituted horse sense for answers, and went ahead.

Horse sense told him that unless he put back each year the minerals and other plant nutrients taken out of the soil in crops, his land would suffer. He found, however, that no one could tell him how much of all the elements were taken out when he made a cutting of alfalfa, or when an acre of pasture had been grazed all season. He is still guessing on some of these items, but he adds a little more fertilizer to be on the safe side when he is in doubt, and watches the results.

The basic theory of Borders' management is that a soil must be balanced in the element of soil fertility in order to produce a maximum crop and to produce top quality milk and meat when the crops are harvested through a cow or a hog.

"I figured to myself," he says, "that there are many more minerals coming out of the soil than potash, phosphorus and nitrogen, but only those three are put back in fertilizer. There are ten or a dozen other minerals, needed in small amounts, but just as important."

The crux of Borders' management is that the four elements needed by plants in bulk amounts, nitrogen, potash, phosphorus and lime are no more important to plants than the dozen or more trace elements. Of the latter, some are used directly as plant nutrients, some act as catalysts, making the others available. The chain of plant nutrients is as strong as its weakest link—one deficiency may throw the whole cycle out of gear. BALANCE is needed.

Borders' scaly necked calves led to his first interest in trace elements. He could find very little definite information on the function of the trace minerals in nutrition. Neither could he find anyone who would do more than venture a guess on the amount needed in a balanced soil nor which of the 98 elements were needed to maintain the maximum health of plants and animals. He was, however, sure of one thing—that a balanced soil would produce a maximum crop of maximum quality. He set out to supply every needed element in the right amount.

He found out that there was only one laboratory in the country which could give him a quantitative analysis of his soil and at the same time would venture to estimate the amount of deficiency and propose a treatment. (In the Midwest the Farm Clinic of West Lafayette, Ind., and others are preparing facilities to make quantitative soil analyses for farmers.)

He invested $60.00 in an analysis, made by the Farmer's Research Foundation of San Francisco, California. The analysis showed that on his farm the trace minerals were woefully inadequate. There were insufficient copper, manganese, zinc, cobalt or iodine; there were only slight traces of boron, sodium and fluorine. Iron alone was adequate. The calcium, magnesium, phosphates, potash and nitrogen, Borders figured, would go on in the usual way, supplied by fertilizer and carriers, and by liming.

The deficient elements would have to be supplied in addition to the regular fertilizers.

His first setback came when he tried to buy the trace elements in a form plants could use. Some, he found, he could obtain only from the drug store or chemical supply house, and only at prohibitive prices. He called in a representative of his fertilizer company and together they worked out a method of adding the trace minerals to the fertilizer he ordered.

The amount of trace minerals to correct each deficiency, estimated by the Farmer's Research Foundation, would be mixed with ordinary fertilizer and applied at the rate of one-tenth the deficiency each year for ten years. Borders chose this method because he believed that to put down the whole of the deficiency at one time might be harmful. For example, copper, manganese, zinc, and boron (boron is the most likely of the trace elements to have toxic effects with an over-application) together

AN UNDERGROUND RIVER has been tapped for water on the Borders farm. Here are selected Holstein heifers which will go into the milking herd next year.

THIS FIELD had the full-scale Borders Treatment and produced 32-inch alfalfa in thirty days after the second cutting.

THIS FIELD, same age and cutting, had the same amount of fertilizer, but lacked trace minerals and other items of Treatment.

THE WORMS moved in to make homes in the balanced soil on the Borders farm. June bug grubs and earthworms add their castings to enrich the soil, areate it, and increase its water-holding capacity. They feed on dropped leaves and mulch and some roots.

with some of the nitrogen, might be too hot in a single application. Also, the estimates of deficiencies were, in some cases, only vague guesses. No soil chemist has yet determined the exact amount plants and animals need of each element.

The Borders Treatment

Borders bought this farm of 560 acres five years ago. It was badly run down, producing an average of only 35 to 45 bushels of corn per acre. Fifty cattle had to work hard to find enough grass to keep the milk pails full. The land had been on the conventional corn—soybean—oats—hay rotation, the usual rotation for southern Kentucky. The soil is red clay, which is potentially good alfalfa land but is subject to compaction at plow sole level.

Borders, a practical man, warns against expecting a miracle from the application of trace minerals. "The success I've had in increasing pasture and crop production on my farm," he says, "didn't come from trace minerals alone, but from a combination of good farm practices." Borders believes that just as important as trace minerals are fertilization, cultivation, rotation, grazing, manure, soil balance, and mulching. "They are all necessary," he says, "and omitting one may seriously affect the result."

"A lot of farmers think they can go out and throw a shotgun mixture of trace minerals on their fields and fill their mows with hay," he adds. "They are in for a big disappointment."

Another warning is not to expect phenominal results the first year.

The first year Borders noticed only slight improvement, but thereafter yields began to climb and have increased each year since. He has treated two or three fields each year, increasing his herd as he put his land in shape.

When Borders bought the farm the first thing he did was to toss the four-year grain-hay rotation out the window. He substituted a ten-year "grass" rotation.

On the fields which he treated the first year he added enough lime to bring the pH to a shade under seven. Then he broadcast rock phosphate, a ton to the acre. He disced the field both ways and drilled in 22 pounds of alfalfa seed per acre. Drilled in at the same time was the fertilizer and trace element mixture, 300 pounds of 4-12-4 plus 100 pounds of the trace elements. The latter contained one-tenth of the estimated deficiencies in a peanut shell carrier.

The second and third year, after cutting in the fall, 500 pounds of 0-12-7 plus the trace mineral mixture, one-tenth of the deficiency as before, was top dressed. In the fourth year the fertilizer was increased to 700 pounds. If the alfalfa looks good to Borders the fifth year, he reseeds with 12 pounds of seed and allows it to stand. If it shows signs of petering out after five years, the field is retired from alfalfa and a pasture mixture is drilled in after discing. This mixture is 12 pounds orchard grass, 5 pounds timothy, 5 pounds blue grass, 1

COLUMN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
SAMPLE NUMBER	Active PH	Active Calcium Lbs. Per Acre	Active Magnesium Lbs. Per Acre	Available Phosphate Lbs. Per Acre	Available Potash Lbs. Per Acre	Total Nitrogen Lbs. or % Per Acre	Copper Lbs. Per Acre	Manganese Lbs. Per Acre	Zinc Lbs. Per Acre	Cobalt Lbs. Per Acre	Iron Lbs. Per Acre	Vanadium Lbs. Per Acre	Boron Lbs. Per Acre	Iodine Lbs. Per Acre	Sodium Lbs. Per Acre	Sulphur Lbs. Per Acre	Fluorine Lbs. Per Acre
No. A	5.7	2140	240	50	200	0.147%, 2940	None	None	None	None	55960	None	8	None	350	200	570
No. B	5.6	2420	320	50	150	0.014%, 280	None	None	None	None	58040	None	4	None	200	280	760
No. C	7.2	2580	220	10	150	0.014%, 280	None	None	None	None	65740	None	None	None	Trace	140	380
No. D	6.9	2760	260	25	150	0.007%, 140	None	None	None	None	55960	None	8	None	Trace	120	380

A QUANTITATIVE ANALYSIS of the soil on four fields on the Borders farm. This analysis was made by the Farmer's Research Foundation of San Francisco under the direction of Lee Vanderlinden. Comparing the amounts of minerals present with those required in a "normal" soil, Borders applies ten per cent of the deficiency each year along with his regular fertilizer applications. At the same time the analysis is submitted the Foundation makes recommendations for the crops planned. The Foundation, a non-profit organization, is sponsoring a plan to establish laboratories available to every farmer in the country.

pound ladino, 4 pounds red clover, 10 pound of alfalfa, and 4 pounds of fescue; 41 pounds per acre in all, at a cost of about $17.00.

Drilled in with the pasture mixture are 300 pounds of 4-12-4 and 100 pounds of trace mineral mixture. Two crops of hay will be taken off the first year after which it is used for pasture. This schedule will be followed for three or four years. The field then goes into corn, then oats, and then back to alfalfa.

Borders figures that the first application of fertilizer for alfalfa, 300 pounds of 4-12-4, and 100 pounds of the trace mineral mixture, costs him $12.75; the trace mineral's share being about $6.00. The second, third and fourth years, the cost is $17.25, and the fifth year $21.75. The total cost of fertilizer, seed, rock phosphate and lime, for five years, is approximately $95.00, excluding labor. He values the crops from each acre, in terms of milk, butterfat and meat, at about $175.00 per acre.

Corn and Tobacco

Borders' ten year rotation calls for only 30 acres of corn per year. He has ten acres in tobacco base and sometimes as much as 70 acres in oats. He ensiles the corn and buys most of the grain for dairy feed. "My fields are worth more in pasture and hay than in corn," he says. The bulk of the manure produced on the farm is put down in the pastures by the animals themselves.

The manure from the dairy barn goes on the corn and tobacco. The rotation allows a very heavy application of manure on the corn field, once every ten years. This, plus the great amount of humus supplied by the grasses, Borders believes, is sufficient to keep the soil in good tilth. His fertilizer program is designed to put back a little more each year than is taken out by the crops.

May to December

What returns does Borders get from his fertilizer outlay of about $20 per acre per year? From March 1 to May 1 of 1948, he pastured 116 cows and 30 brood sows on 90 acres. From May 1 to December 1, he pastured 60 cows on 45 acres. On October first, the grass was half-knee high on this field and he had more than his stock could harvest. In 1949, 210 acres in hay and pasture took care of 265 head of cattle and 200 hogs from May 1 to December 1, and supplied winter hay for this stock, plus 350 tons of alfalfa and mixed hay which was sold. His hogs roamed the clover and alfalfa pastures during the season and this cut down their grain needs for finishing. Even though no minerals were fed, and the hogs were not ringed, there was no rooting. Borders believes they get sufficient minerals in pasture. "A hog won't root unless he lacks minerals," he says.

Heifers, calves and dry cows get supplement. Cows in lactation get a minimum

A RANDOM PINCH of soil from a Borders field showed more than half as many worm castings as soil particles. A much greater bulk of castings must be below the surface. A worm casting is superior to any commercial fertilizer in plant nutrients.

THE BORDERS HERD lines up for the evening milking. At milking time the herd bull leads his harem in from the field, walks with grave unconcern through the milking parlor.

supplement of one pound of 16 per cent protein for each 4½ pounds of milk.

Borders does not rotate his pastures. "I believe rotation is a good thing," he says, "but I haven't needed it. I have 70 acres of good pasture which I haven't used at all this year. When I build my milking herd to 200 and my total cattle to about 350, I'll rotate the pastures." He clips his pastures twice a year for weed control.

He puts up 1250 tons of silage each year—250 of corn and 1000 of alfalfa. Some of the excess hay is baled. It was this surplus baled hay which was sold last year.

Last year his 140 cows in lactation produced 1,750,000 pounds of milk.

He has a carefully selected grade Holstein herd. The herd is closely culled and quality is boosted by five registered bulls.

In the low month of August, 1949, production was 130,198 pounds; in May it was 175,250.

The herd spends most of the time, winter and summer, in the fields. A milking line is used. Four men do all the work in the dairy. On the line, one man washes the animal and three handle the machines. A cow leaves the line every 75 seconds. The milk is automatically weighed, conveyed through pipes to the cooler and from there to a tank truck.

Sidelights on Trace Minerals

Farmers, soil scientists and agronomists have made a path to Borders' door during the past year. Borders, a plump, apple-cheeked giant, takes them out to his fields, pulls up great handfuls of alfalfa, and shouts, "Did you ever see alfalfa like that; 32 inches high in 30 days!"

Sooner or later he calls attention to the tremendous worm population of his

FOUR MEN operate the milking line. The first man washes the udder. A cow comes into the line every 75 seconds.

TWO MEN operate the milking machines, record the milk, which is weighed automatically and dispatched to cooler.

TRACE MINERAL MIXTURE

The trace mineral mixture which Borders uses contains the following elements, Zinc Sulphate, 9.62%; Molybdenum, 0.03%; Copper Sulphate, 5.12%; Sulphur, 0.43%; Boron, 0.60%; Potassium, 0.11%; Manganese Sulphate, 5.91%; Chlorine, 0.83%; Calcium, 12.86%; Carbon, 0.17%; Sodium, 0.09%; Nickel, 0.24%; Iron Sulphate, 7.60%; Aluminum, 0.02%; Iodine, 0.96%; Titanium, 0.31%; Cobalt, 0.15%; Barium, 0.09%; Magnesium. 3.80%; Phosphorus, 2.15%. Total 51.09%. The remaining 48.91 per cent is peanut shell carrier. This mixture, added 1-to-3 to the fertilizer, supplies approximately one-tenth the trace mineral deficiency per year.

fields. A four year old alfalfa field was so thickly covered with worm castings and worked-up soil that it appeared to have been topped-dressed with compost. Inspection shows a grub or an earthworm or two around each stalk of alfalfa. A handful of earth picked up at random shows the surface soil to be composed of a high percentage of worm castings.

"The first thing I ask the experts," Borders says, "is how come I have so many worms here. They don't know. I believe the worms come in because I have balance in my soil."

Just over the fence on the next farm there are few signs of worms.

The tremendous tonnage of castings no doubt adds to the fertility of the soil and partly accounts for the unusual yields. The worms do not touch the living plants, eating only the surface mulch.

Borders has had no breeding troubles since he added trace minerals to his program, and no cases of disease of any sort.

The luxuriant overcoat of grasses which covers almost the entire farm has stopped erosion, and increases its water-holding capacity. Two wet-weather springs now flow the year around.

That the trace elements are getting out of the soil, into the plant, from there to the cow and then into her milk, is indicated by a recent bulk spectrographic analysis of the milk from the Borders farm. The ash, which was 0.685 of the green plant, had the following composition: calcium, 21.78 per cent; magnesium, 2.36 per cent; potassium, 24.02 per cent; sodium, 7.88 per cent; iron, 0.006 per cent; phosphorus, 30.40 per cent; chlorine, 12.57 per cent; sulphur, 0.99 per cent; total 100 per cent.

Borders is a discontented farmer, never satisfied with what he has. He isn't satisfied with nine tons of alfalfa per acre, nor a herd of 140--he's going after more tonnage and says his farm can support 200 milking cows and a corresponding increase in heifers, dry cows and calves. And as for alfalfa, he is planning very soon to irrigate a field, using an underground stream as a source of water. This stream, known as Lost River, runs diagonally across the farm. Three hydraulic rams supply all the water for the farm, one pipe line running for three-fourths of a mile to a distant barn.

Joined up with Borders' trace minerals, his worms, his ten year rotation and other practices, irrigation may well give him a crop of alfalfa the like of which farmers have never seen before.

TOP AND SUBSOIL ANALYSIS

Quantitative analysis of top and and subsoil on a 50 acre pasture on the Borders farm.

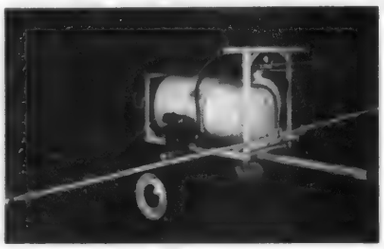
Element	Top Soil 4" to 8"	Subsoil, below 12"
PH Value	6.48	6.02
Active Calcium	2573	2516
Active Magnesium	192	402
Available Phosphate	Trace	Trace
Available Potash	30	30
Total Nitrogen Compound	1760	0.074% 1480 lbs.
Copper	None	None
Manganese	Trace	40
Zinc	50	Trace
Cobalt	Trace	5
Iron	55952	81970
Boron	Trace	Trace
Iodine	None	None
Sulphur	262	220

An analysis of both the top and subsoil is necessary to show a complete picture of fertility. Note in the above that in almost every case more minerals are available in the subsoil than in the topsoil. These can be mined by deep-rooted crops or deep cultivation. Theoretically a perfect soil should carry about 7000 pounds of organic and inorganic nitrogen compounds in the first six inches of topsoil. When Borders found his cows licking the dirt out of a posthole he concluded the subsoil contained minerals lacking in the topsoil.

FROM THE LINE the milk goes to the cooler where it passes over refrigerated coils. No hands touch it on its travels.

FROM THE COOLER it is piped into a sterilized tank truck and in a few minutes is on its way to the processing plant.

KROMER Trailer Units are available in three models—with five boom lengths—13' to 40'. Booms mounted front or rear.



KROMER
POWER INSECT WEED AND SPRAYERS

KROMER Sprayers have LARGE booms—LARGE volume, high-pressure pumps and LARGE hose capacity for high gallonage corn borer and other control work. Years of dependable field service have shown that KROMER Sprayers deliver the correct volume and an even distribution of chemicals. Sensitive pressure regulator provides accurate control for low gallonage application when necessary.

Insist On All-Steel Construction—Do Not Accept Substitute Materials

All-Steel construction protected from rust and chemical corrosion by Finish "X" is superior in strength and economy to all other materials. Finish "X" used on KROMER booms and tanks is guaranteed to prevent rust and corrosion for the life of the KROMER Sprayer.

Other features that make KROMER Sprayers dependable and satisfactory include KROMER'S wide angle fan type nozzle with long life, cylindrical shaped orifice. This feature maintains uniform application and minimizes drift due to wind. KROMER hose is made of Hycar, a compound of Buna N rubber for highest chemical resistance.

We have helpful information to send you. Write us today.

O. W. KROMER CO.
Dept. X, Minneapolis 11, Minn.

Manufacturers of
Tractor Mounted Sprayers
Trailer Sprayers Highway Sprayers
Railroad Sprayers
Self-Propelled Sprayers

KROMER
POWER INSECT WEED AND SPRAYERS

KROMER Tractor Mount Sprayers are made in four boom lengths, 13' to 32'.

KUDZU

(Continued from page 57)

tive in drying out the stems at about the same rate as the leaves. Pole racks, set up in the field, are being used to dry kudzu. Kudzu hay should be handled as little as possible so as to avoid shattering. Many farmers use their side-delivery rakes and one-man hay-balers on kudzu.

Yields of one ton to four tons have been made on Class 4 land. What it would produce if every square foot of land in the acre was host to a kudzu crown, there is no estimating. The hay is about 50 per cent leaf and about two cuttings are all that can be expected, one in early summer, the second in late fall. Kudzu hay has brought from $32 to $40 a ton, although there is no regular market for it as yet. One large grower dehydrates it, grinds it into a meal, and gets from $60 to $80 per ton for use in chicken and hog feeds.

FEED VALUES OF FROSTED KUDZU AND KUDZU MEAL

	Moisture	Ash	Protein	Crude Fat	Crude Fiber	N.F.E.	P_2O_5	Ca
Kudzu Leaf Meal	5.13	7.92	26.00	4.09	19.67	37.19	.49	1.38
Frosted Kudzu								
December 1	3.31	8.33	23.00	3.63	23.07	38.36	.43	2.30
January 15	7.83	8.39	20.88	4.82	24.49	33.49	.46	2.17
March 8	6.24	18.56	18.75	7.70	22.28	26.47	.44	2.24

Analysis made by Georgia Experiment Station — Experiment, Ga.

Kudzu For Winter Grazing And Rotation

Kudzu drops to the ground when struck by frost but its feeding value is only slightly impaired. It falls upon its own mattress of leaves and vines and remains there until the weather and the trampling of livestock have caused it to disintegrate. While it lasts, the livestock will continue to eat and to grow on it. And when it is quite consumed it is a natural environment for a succeeding grazing crop, the nitrogen being available to the following crop, the land being warmer than bare land and thereby facilitating the early growth of the succeeding crop. The humus also aids in holding moisture for the succeeding crop. Oats is the best crop to succeed the dormant kudzu in winter, because it grows faster than other grazing crops. Ryegrass is a close second. Other good following crops are crimson clover, Oregon common vetch, and wild winter peas. But oats comes on faster and furnishes more actual winter grazing than the other crops. When the following June rolls around. the kudzu will come out and take over again.

There has never been a case of bloat reported on kudzu, nor any ill effects even when aimals are turned to it after dry feed.

Although there are a few farmers who use kudzu seed to establish their fields of kudzu and others who use seedlings which have been developed in fields or nurseries from seeds. the most common method of establishing kudzu today is by the use of crowns. Crowns selected for planting usually have one or more healthy roots several inches long and one-half inch or more in diameter and with the bud or buds forming the top or crown. Two and three-year old crowns are preferred. Crowns can be purchased from professional kudzu growers at about $12 per thousand.

Kudzu is usually planted on uplands on Class 3 or 4 fields, which means they have slopes ranging from 7 to 11 degrees and that at least half of the topsoil has vanished through erosion. A deep seedbed is made by plowing and harrowing and then a general fertilizer, 6-8-6, is recommended and is spilled across the fields at intervals of 30 feet. The fertilizer is "bedded on" as it is on sweet potato beds. The fertilizer is applied just before winter sets in. After the first hard freeze when the kudzu crowns are dormant, the bed is opened up lengthwise with a scooter or furrow plow and the bed is ready for planting. Crowns are spaced about four feet apart in the row, 500 to the acre, and packed fairly tightly in the ground, the crown being covered very lightly and the roots being made comfortable in the furrow.

Nothing happens until warm weather moves in and then the crowns begin to sprout. By the first of July the runners are beginning to move out from the crown and it is then time to give the areas between the rows a good cultivation. This should be done again a little later in the summer. If the season is dry and the kudzu runners do not get much growth, the field should be let alone all through the following winter. If, however, the runners get out from the crown and become pretty well established, the entire area should be given a treatment of lime and phosphate (1 ton of limestone and 600 pounds of super-phosphate) or 1200 pounds of basic slag per acre. The fertilizer is broadcast. This should be done in the late winter and as soon thereafter as the weather permits; then the entire planting should be thoroughly disced with a bush-and-bog harrow or a disc tiller.

The kudzu should be let alone until the end of the third year and should be well established by then. From then on it

Snow changes this scene ...

but Frost never hides it

During three cold winters, frost has never blocked out the view through this window in the G. W. Arny home, Du Page County, northern Illinois. It is glazed with *Thermopane** insulating glass.

Thermopane has a blanket of dry air sealed in tightly between two panes of glass. The warmer room-side surface of *Thermopane* stays clear when single windows are steamed and frosted. Even at zero you enjoy a clear view of the outdoors.

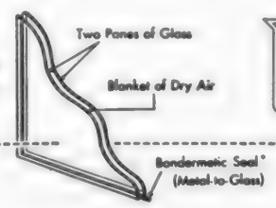
You can sit comfortably right next to *Thermopane* windows. No chilly feeling. The entire room stays warm with less fuel.

Thermopane stays in your windows . . . no storm sash to put up and take down, none to wash and store away. In summer it helps keep heat out, keeps rooms cooler.

For greater comfort, fuel saving and frost riddance, insulate your windows with *Thermopane*. It comes in more than 80 standard sizes for use in double hung, casement and picture windows, made of either wood or metal. Sold by glass and building supply distributors and dealers. For more information, write for our complete *Thermopane* book.

*®

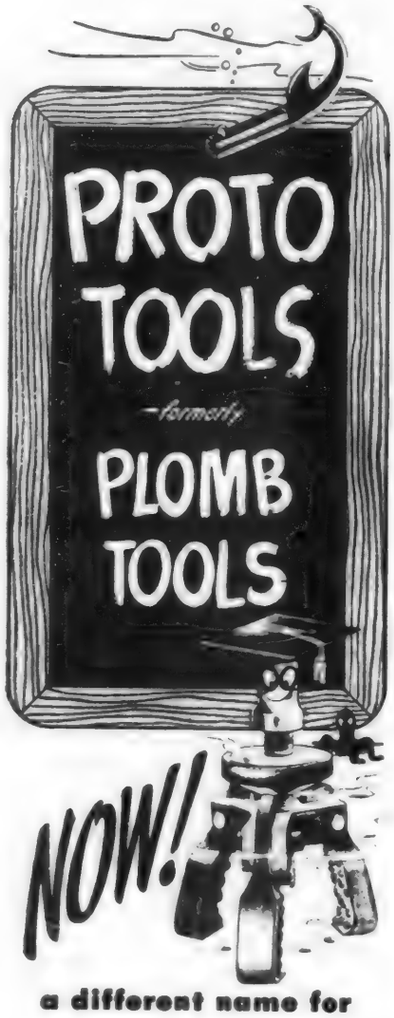
FOR BETTER VISION SPECIFY THERMOPANE
MADE WITH POLISHED PLATE GLASS



L O F

Thermopane

MADE ONLY BY LIBBEY·OWENS·FORD GLASS COMPANY
3135 Nicholas Building, Toledo 3, Ohio



a different name for your old friends!

In PROTO tools — formerly Plomb Tools—you get just what the name means, PROfessional TOols. They have the designs, special scientific heat treating and over-all quality that have made them farmers' favorites for 42 years. Buy the best! Buy PROTO from your dealer now.

Write for catalog to

PLOMB TOOL COMPANY

2203P Santa Fe Ave., Los Angeles 54, Calif.

4987

PROTO
Professional Quality
TOOLS
LOS ANGELES

should receive an average of 400 pounds of limestone, 200 pounds of superphosphate and 60 pounds of muriate of potash per acre per year.

If manure is used, it should be broadcast on the field in late winter. If allowed to come in contact with a freshly planted crown it will cause a form of rot. If properly planted and fertilized and the weather is kind, kudzu may grow five or six feet a week after a good start.

The cost of planting an acre of kudzu is as follows:

500 crowns at $12.00 per M	$ 6.00
Fertilizer, first year, 400 lbs. 6-8-6	9.00
Fertilizer, second winter	11.50
Labor and equipment	12.00
Total	$38.50

If a farmer already has a stand of kudzu and wishes to use his own crowns for additional planting, he has only to turn his kudzu in winter with a turn plow and then cut the crowns from the root system with a large corn knife. The crowns are sacked at once to keep them from drying out and are kept moist by packing with a small amount of soil. They are planted as soon after digging as possible.

Kudzu smothers weeds once it has a good start. Usually by the second season weeds are no longer a problem.

If it is used in rotation, it is eradicated by plowing down. However, it is usually planted on steep hillsides and gullied pastures and is almost always a permanent fixture on the land once it is established.

Kudzu has been given so much publicity as a marginal land crop that its value on good fields is overlooked. Its return in grazing and hay is merely multiplied if it is planted on good soil.

Its greatest value, however, is that the three years needed to establish it are never missed when it is planted on marginal land which would be idle anyway. Once marginal land has been given the "kudzu treatment" it is no longer marginal, but ready for row crops again.

While it takes continuous grazing, it should not be grazed closely early in the spring nor between August 15 and September 15. To do this would destroy its value as a late season pasture. From September 15 until it is gnawed to the ground during the winter, it returns its best values.

How Far North?

Kudzu is an established fact in the South, but to northern farmers it is still only a rumor. They hear the huzzas from the south and are curious. They must wait. Experiment stations and private experimenters have found that the present known types cannot be successfully grown where temperatures fall below 15° F. Below this the vines die back to the crown and one season's growth is not profitable. It does best on land under 500 feet elevation. It mush have a long growing season and not less than 30 inches of rainfall. This limits its use in the plains area also.

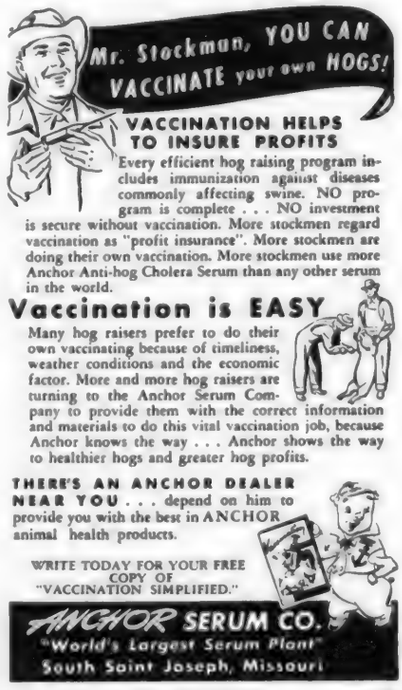
Efforts are being made to develop a variety for northern pastures. Dr. Hugh H. Bennett, chief of the Soil Conservation Service, has undertaken this, as has the Beltsville station. At Beltsville only fair results were obtained from plantings of seed from northern China.

It puts out a vigorous summer growth as far north as Maryland and is being used for erosion control of highway embankments in Kentucky. Farther north it may be encouraged to grow during the summer, but it winter-kills and will produce no seeds.

The Rural New Yorker reports a thriving growth of kudzu 30 miles north of New York City. This was planted in 1928 and after two or three years of a touch-and-go battle with the sub-zero temperatures it suddenly took hold and has been thriving ever since. Mrs. Edna C. Jones, of Rockland County, on whose farm the kudzu is growing, says? "It freezes back to the ground each winter, then starts from its perennial roots in the spring and literally runs rapidly in all directions. This year it was 30 feet up the roadside oaks."

It could well be that a hardy strain of the plant has developed on the Jones farm. The thermometer goes down to 20 below in this part of New York, certainly a test for the plant. This is 200 miles north of any winter-hardy plantings previously reported.

THE AUTHOR—Channing Cope is almost as well known as cotton in his home state of Georgia. His voice blankets the state in his two daily farm radio broadcasts. His daily farm column in the Atlanta Constitution has a wide following among both city and country people. He does most of his work from the study in his farm home at Yellow River Farm, near Covington, Georgia. It was here too that he wrote his recent, widely read book, Front Porch Farmer, from which his Kudzu article was adapted. He is an active member of enough farm organizations to fill a sheet of paper, and is known across the land for his views on soil conservation.


Mr. Stockman, YOU CAN
VACCINATE your own HOGS!
VACCINATION HELPS
TO INSURE PROFITS
Every efficient hog raising program includes immunization against diseases commonly affecting swine. NO program is complete . . . NO investment is secure without vaccination. More stockmen regard vaccination as "profit insurance". More stockmen are doing their own vaccination. More stockmen use more Anchor Anti-hog Cholera Serum than any other serum in the world.
Vaccination is EASY
Many hog raisers prefer to do their own vaccinating because of timeliness, weather conditions and the economic factor. More and more hog raisers are turning to the Anchor Serum Company to provide them with the correct information and materials to do this vital vaccination job, because Anchor knows the way . . . Anchor shows the way to healthier hogs and greater hog profits.
THERE'S AN ANCHOR DEALER NEAR YOU . . . depend on him to provide you with the best in ANCHOR animal health products.
WRITE TODAY FOR YOUR FREE COPY OF "VACCINATION SIMPLIFIED."
ANCHOR SERUM CO.
"World's Largest Serum Plant"
South Saint Joseph, Missouri

THE ETERNAL PLAGUE

(Continued from page 59)

various species of hoppers are concentrated. This tells the scientists where they should search for eggs to count in the second survey. The egg count is the most important indicator of the grasshopper population for the coming year. The final survey is conducted the following spring to tell when the eggs have hatched, so the poisons can be spread at the most effective time, which is before the young have dispersed from the egg beds.

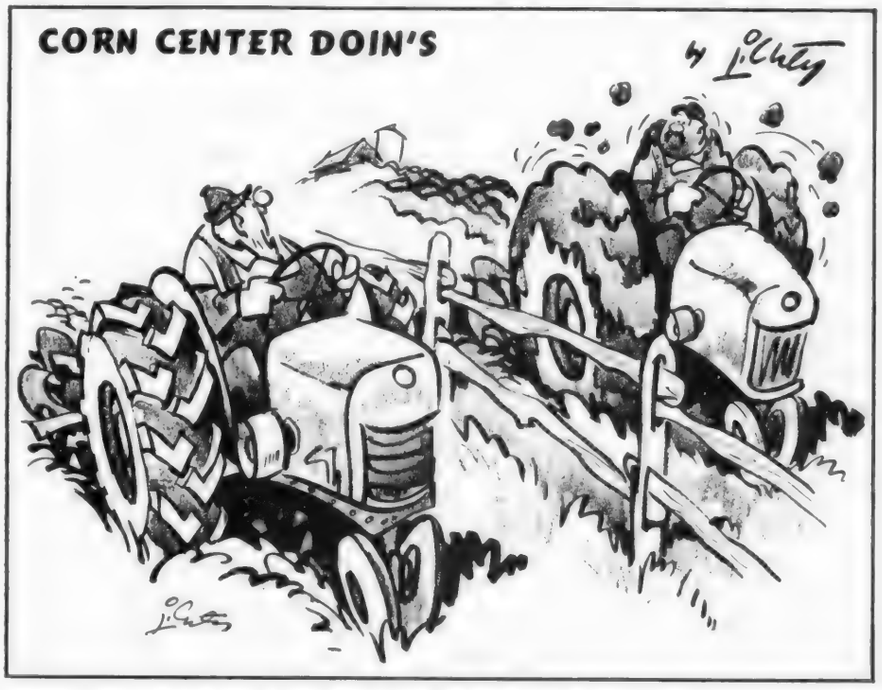
The egg survey is conducted in every county where the hoppers are a serious threat. Locations for the egg count are selected mathematically, along lines drawn on maps of the areas, to give a good picture of the possible threat for each locality. The eggs are deposited by the female hoppers in long white pods, often as many as 100 eggs to the pod. The female thrusts the eggs down into the soil where they spend the winter. The adults all die when cold weather comes. The methods of digging the eggs for sampling depend on the species being checked, since each species has its favorite egg laying location.

The "lesser migratory" grasshopper lays its eggs in stubble fields and soil blown fence rows. To gather the eggs the surveyor uses a shovel with a sharpened blade so he can take a sample of earth three inches deep, six inches wide and one foot long. He sifts two of these samples of surface soil through a wire screen and records the number of egg pods left on the screen for each square foot of soil sampled.

Areas surveyed for grasshopper infestations are rated from one to five on the basis of the number of egg pods per square foot. Normal infestations are rated (1). Very heavy infestations are rated (5). With the aid of special conversion tables worked out from previous research, egg counts enable the entomologists to tell how much poison bait an area should get when the young hoppers hatch and begin to eat. Colored maps carrying this information are sent to federal and state officials who supervise the hopper control work out on the farms.

Until recently the control measure was spreading poison baits and cleaning up waste areas along fences and field borders where the hoppers breed in numbers. Now, new chemical insecticides promise to supersede baiting on cultivated crops, and farmers in many sections are already switching to poison sprays and dusts under the direction of the USDA. Bait is still spread for the control of range hoppers.

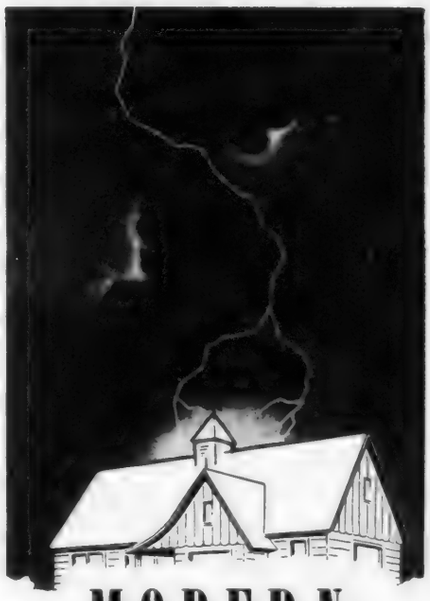
The insecticides which have shown most promise in taking the job away from poison baits are chlordane and toxaphene applied as sprays and dusts. The results from these chemical campaigns are promising enough to prompt conservative



"What you need, Lem, is a set of these BFG Power-Curve tires!"

Here's a new kind of tractor tire tread that gives you more traction, more power. It's the B. F. Goodrich Power-Curve tread. Tested side by side with other leading makes, this new tire outpulled and outwore them all! The new B. F. Goodrich tractor tire uses the proven open center principle plus curved cleats. The special curve reinforced at the center of the cleats, allows natural self-cleaning, a deeper bite and longer wear. See the B. F. Goodrich retailer next time you're in town. He will show you how you can save with the new Power-Curve tread.

An advertisement of The B. F. Goodrich Company, Akron, Ohio



MODERN LIGHTNING PROTECTION

FOR FARMS AND COUNTRY HOMES

Lightning still starts three-eighths of all farm fire losses—more than twice as many as any other cause. Water piping and electric conduit, steel tracks and air ducts, all add extra hazard in modern buildings.

Security System does more than divert lightning strokes—it is engineered to *prevent* lightning from striking. Among thousands of buildings fully protected by Security, not one has ever been destroyed by lightning. With modern low aerial points, Security System is hardly visible. With Green Guard, shown below, it protects *both* building and electric equipment.

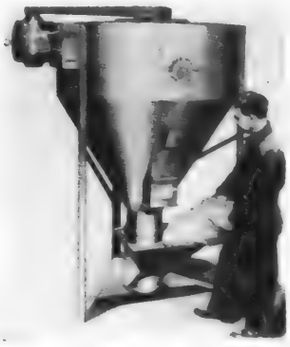
PROTECTION FOR ELECTRICAL APPLIANCES . . .

Green Guard Lightning Arrester protects lamps, motors, ranges, hot water heaters from surges induced by lightning. Prevents flashes induced in outlets, switches. No moving parts—nothing to wear or burn. Guaranteed five years; should last a lifetime. Get the full story now on both Security System and Green Guard. Address Security Mfg. & Contracting Co., Burlington 5, Wis.

SECURITY

Lightning Protection in the Modern Manner

SUBSTANTIAL SAVINGS!



Mix Your Own Feeds with

BROWER "Whirlwind" MIXER

Save $10 to $12 per ton of feed. Mix your own formulas, using grains from your farm. Save time. Have fresh mixed feeds when you want them.
Mixes a perfect blend in 10 minutes. 5 sizes, mixing 700 to 4000 lbs. feed per batch. World's largest selling mixers —over 8,000 in use.

30 DAY TRIAL. Write for catalog and prices.

BROWER MFG. CO., Box 5167, QUINCY, ILLINOIS

World's Largest Line of Poultry Supplies

DAISY *Cattle Markers*

DELIVERY ONE TO THREE DAYS POSTPAID

No. 21—FOR NECK. Adjustable chain. Numbered both sides. $11.50 per dozen.

No. 17—FOR HORNS. Adjustable chain. $8.00 per dozen.

No. 25M — Marker Plates without chain. Key Ring Fasteners. $6.50 per dozen.

No. 38—DOUBLE PLATE NECK CHAIN. Upper portion strap; lower portion chain. $12.50 per dozen.

No. 25—DOUBLE PLATE ALL CHAIN MARKER. SOLID BRASS MARKER PLATES, numbered both sides. Chain is brass plated. Weight, 1 lb. each.

Price: $14.50 per dozen

Sample mailed for $1.00. Write for folder.

GOLDEN ARROW FARMS
Dept. 11, Box 7 Huntington, Indiana

Potent Humus-Base:

INOCULANT for ALL LEGUME SEEDINGS

Whether planting clover, alfalfa, lespedeza, peas, beans, lupines, peanuts or any other legume, it pays to assure maximum crop vigor and nitrogen-fixing power by always treating seeds with the famous "Inoculant in the Carton."

LEGUME-AID

The finely ground humus base in which LEGUME-AID carries its potent strains of nitrogen gathering bacteria is neither sticky or gummy. It pours freely, coats seeds thoroughly and clings to them closely—yet never clogs the drill. Most progressive seed dealers will gladly supply this reliable, field proven, legume inoculant. Or write direct for information.

AGRI-LAB-INC

AGRICULTURAL LABORATORIES, INC.
1310 Chesapeake Avenue Columbus 2, Ohio

entomologists to suggest this treatment for much of the grasshopper territory.

The old poison bait, which was a mixture of sawdust and bran treated with sodium fluosilicate, worked slower than chlordane and toxaphene and lost its effectiveness sooner. The residue of the two new chemicals lasts from one to three weeks under a wide variety of weather conditions. The recommended rates of applying them are from one-half to one pound of technical chlordane or one to one and a half pounds of technical toxaphene per acre.

They may be applied from ground dusters, sprayers, or airplanes. The USDA has set up a list of four major points to keep in mind when using these chemicals for grasshopper control. (1) Take proper precautions in handling and using them. Like most insecticides, they are poisonous to man and stock. Forage treated with chlorodane or toxaphene should not be fed to dairy animals or animals being finished for slaughter; (2) Spray or dust the infestations of young grasshoppers before the young begin to move out of the area. If the action is delayed until they have spread out over the crop land, the area to be treated will be much larger. These early infestations are often found along roadsides, field borders and in waste areas where the eggs were laid; (3) Treat margins of corn fields and small grain fields when small grain begins to mature and before the hoppers move into the corn; (4) When an entire alfalfa field is being destroyed by hoppers it is usually the best practice to cut the alfalfa and afterwards apply the chemicals to protect the next cutting.

Chlordane and toxaphene have also modernized the poison bait technique for the control of range hoppers. The newest baits, and ones which are working well, are brans treated with toxaphene or chlordane to make either wet or dry baits which can be spread by airplane or ground spreaders.

One control measure which farmers are giving up is the use of the plow, which was widely used in the past to destroy egg beds. Jack W. Lomax, Extension Entomologist with the Nebraska Extension Service gives part of the answer when he says, "Our agronomy department is pushing a program to return a lot of Nebraska land to grass, and the farmers are quite reluctant to plow up fence rows to destroy grasshopper eggs." In addition, the present-day farmer seldom finds time to employ these slow control methods.

The grasshopper will not be exterminated in the forseeable future, much to the farmer's regret. During the coming summer the grasshopper experts expect another outbreak and the equipment to combat it has been made ready for the job. Whether or not the serious infestations will continue, reaching their peaks at roughly 10 year intervals, remains to be seen.

Some entomologists frankly think the grasshopper is here to stay. Wayne J. Colberg, Extension Entomologist for the State of North Dakota says, "The possibility of ever reducing grasshopper populations to a point where the insects will never be of economic importance is very remote because we simply cannot put on a spray program that will completely cover the entire area. There is always some waste land that produces enough grasshoppers to threaten our crops. We must also remember that during serious years, hoppers fly in from adjacent states."

Colberg's sentiments are echoed by Jack Lomax of Nebraska. He feels that while there is definitely hope on the scientific horizon of reducing grasshopper populations, there is little chance that research now under way will lead to the eradication of grasshoppers within the next year, two years, or several years." "I am afraid," he says, "that in Nebraska at least we will have grasshopper troubles for a long time to come."

The pioneering western farmer, who for days at a time could not see the sun for clouds of migrating grasshoppers, was born too soon. Insect control was in its infancy. To hopper plagued farmers of the past century, our methods of fighting hoppers with airplanes would probably be as heart warming as was the sight of the gulls winging in to rescue the Mormans from the locust plague.

THE SILENT FARMERS (Continued from page 50)

and the assortment of plows, discs, harrows, and manure spreaders they need to operate their farm. The monastery has its own machine shop, carpenter shop, and saw mill.

Until the farm became mechanized the monks did their field work in their robes. Now, with fast moving machinery under them and the danger of injuries from loose clothing, they wear surplus army clothes at work.

Hay making is one of the big annual chores on the monastery farm. There are eight, widely scattered, large barns to fill and unless they are filled, the monks know that they must buy hay on the market. They bale all their hay and straw. For straw, the baler is set up at one end of the threshing machine and the straw runs directly from the thresher into the baler, eliminating one handling.

Some of the Trappists feel that they have lagged on their pasture program. They have made little effort at rejuvenation, and the old bluegrass pastures have been treated only with an occasional application of lime, and some manure.

On a large farm of this type, where the management is not highly centralized, it is to be expected that jobs will occa-

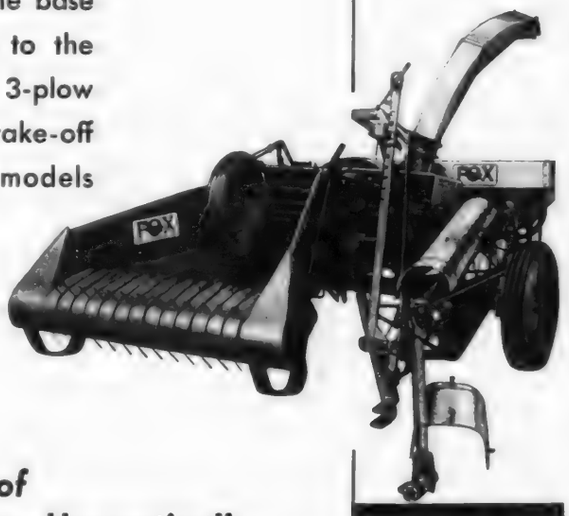
"THE FIRST PART WE HAVE HAD TO REPLACE IN 4 YEARS"

Says: Bob Myers
Lapeer, Michigan

This is the story of the Fox from owners all over the country. Fox, the Pioneer Forage Harvester, has been giving trouble-free service for more than 13 years. Of no other forage harvester can this be said.

The Fox has 3 interchangeable units, the pick-up cylinder, the mower-bar and the corn unit. It will harvest all forage crops grown on the farm. All three harvesting units fit the base machine and the change from one to the other is quickly and easily made. A 3-plow tractor is recommended for power take-off operation. The engine equipped models carry a 40 H. P. engine.

FOX
Forage Master



Ask for demonstration . . .

R. C. Krueger Secretary

SEND for Booklet

"The HISTORY of Modern Forage Harvesting"— . . . it's FREE

FOX RIVER TRACTOR COMPANY

Pioneers of Modern Forage Harvesting

2350 N. Rankin Street

APPLETON FOX WISCONSIN

Grow Stronger, Healthier CHICKS with any HUDSON BROODER

Oil, Gas or Electric

HUDSON offers the RIGHT Brooder in a Complete Line

HUDSON MOTHER-HEN* OIL BROODER

Burns Better Without Cleaning

Up to 30% fuel saving with efficient oil-miser burner that never needs cleaning. Burner is draft-proof, provides steady heat at desired temperature, controlled by famous Hudson Micro-Tem Valve. Choice of three hover sizes: 48 in., 54 in., or 66 in. Start with one according to quantity and size of chicks; purchase other sizes if and when you need them. Six gallon oil tank (average two days' fuel supply).

HUDSON-HART* GAS BROODER

Clean—Dependable

Clay cones above burner reflect radiant heat. Automatic thermostat control. Entire burner assembly attached to hover. Only one burner, one pilot light. Wire guard encloses burner and radiants. Adjustable ventilation openings. Pilot always on—serves as attraction light. Adjustable legs raise hover 3 in. Easily interchangeable jets provided for use with propane, butane, bottled, natural or manufactured gas.

HUDSON LEKTRIK-HEN* ELECTRIC BROODER

No refueling—no bother.

No work—no worry—completely automatic. Two powerful, fully enclosed heating elements. Balanced heat distribution with controlled ventilation eliminates moisture, keeps litter dry. Fully insulated. Adjustable legs allow extra head room as chicks grow. Economical operation (usually less than 1c per chick). Sizes for 500, 300, 100 chicks.

SIGN OF THE BEST BUY

* TRADE-MARK

HUDSON

Tested and Proved

SPRAYERS AND DUSTERS
HAY TOOLS AND BARN EQUIPMENT
LIVESTOCK EQUIPMENT
FARM VENTILATION EQUIPMENT
POULTRY EQUIPMENT

H. D. Hudson Manufacturing Company
589 E. Illinois Street, Chicago 11, Dept. FQS-B

Please send me FREE catalog on Brooders and other Poultry Equipment.

Name .....
Address .....
or R. F. D. # .....
Town .....
State .....
Name of my dealer .....

sionally conflict. In this case, the Soil Conservation Service supplied some seedling pines which were planted in gullied pasture fields. The following year when the pasture was clipped, the monk on the mowing machine didn't know about the trees and the seedlings were clipped.

Want To Be A Trappist?

To become a monk, a man must spend five years living and working in the monastery before he can take his final vows, which bind him to the Trappist Order for life. At the end of two years he takes simple vows, or if he decides that he wasn't cut out to be a monk, he can leave without hard feelings. If he takes simple vows he must stay for an additional three years. Then, he can either leave or stay. If he stays, he stays for good. In recent years about 80 per cent of those who have tried the monastic life at New Melleray have stayed to take their final vows.

TRAPPISTS eat lightly, as one monk reads from the Bible.

Most of the monks may not get into Dubuque for several years at a time. One lay brother was in the monastery 13 years before he got to Dubuque, and then he went only because he was sick and had to see a doctor.

Even the monks have trouble trying to determine what type of person enters a Trappist Monastery. There seems to be no special type. Men from all walks of life have become Trappists. Most of them enter in their early twenties, and the majority of the newcomers are city boys. One monk, in a Rhode Island Trappist Monastery, was a Marine Colonel in the Second World War. He had 14 years of service when he decided to trade his uniform for a robe. Another Trappist was once a Jewish doctor.

A taxi driver in Dubuque said, "I took one young fellow out there. He thought he wanted to be a monk, but after staying two months, he went home again. Damm if he didn't change his mind and come back three months later. That time he stayed."

Why a man enters a Trappist Monastery is another question that confounds some outsiders. Father Michael, guest master at New Melleray, says, "Don't go looking for the answer on the outside. Look for it within the man." But one of the young monks, an ex-GI, felt that becoming a Trappist was his surest way of getting to Heaven, and as he facetiously put it, "I want to see if the gates are really guarded by the United States Marines."

THE CATTLE GRUB

(Continued from page 53)

not due to any particular concern for the feeling of the grub, but because they know that if it is crushed inside the animal its juices may cause an acute sickness known as anaphylactic shock.

Most farmers prefer a more wholesale method of attacking this pest than the squeeze and pluck system. Three methods of treatment have been worked out that will be useful with varying sized herds. They are: spraying with a power sprayer, dusting, and hand washing. Whichever of them is used, treatments should begin from 30 to 40 days after the first grub bumps appear on the backs of the cattle. Treatments should be repeated at 30 to 40 day intervals as long as the cattle are infested.

The killing agent used in each of the three methods of attack is rotenone which has been found to be the most effective insecticide for grubs. To have any effect, the rotenone must be brought in contact with the grub so, whether the animals are sprayed, dusted, or washed, enough pressure must be applied to remove the dried secretions around the grub holes and force the rotenone in.

Power Spraying

Power spraying is the only economical way to fight grubs where large numbers of animals are being treated. A solution of 7½ pounds of five per cent rotenone powder mixed with 100 gallons of water has proved effective. Another recommended solution is 5 pounds of five per cent rotenone powder, 10 pounds of wettable sulphur, and 100 gallons of water.

The rotenone powder is mixed by placing the proper amount in a five-gallon can and using the spray nozzle to wet and mix it. When it is completely dissolved it is poured into the spray tank with the rest of the water.

The animals should be crowded into a chute or small pen (a loading chute will serve) so that the operator can get his spray nozzle directly over them. In larger pens where he can't get closer than three or four feet from the animal with his sprayer; he may wash off a little dirt, but it is a total waste of time and material so far as killing grubs is concerned.

A pressure of at least 400 pounds is needed to drive the solution into the grub holes. The nozzle is held at right angles to the back of the animal and from 12 to 16 inches above its grubby hide. The nozzle should be a solid-cone pattern, drive-spray type with a 5/64 inch opening (number 5 disc). This will produce a coarse, driving spray of not more than four or five inches in diameter at the point where it hits when held at a foot to 16 inches above the back. Three to four quarts of the solution to each animal gives a good coverage.

Dusting

When small herds are being treated, hand-dusting methods can be used successfully. The recipe for the dusting power is: mix thoroughly one pound of five per cent rotenone powder with two pounds of Cream Tripoli earth or pyrophyllite. Place the powder in a quart fruit jar with 12 one-quarter inch holes punched through the lid. Shake well about three ounces of dust onto the back of the animal and rub it into the grub holes with the finger tips using a hard, rotary motion.

With a few head of stock or with particularly valuable animals, the hand washing system is often used. This treatment is slower than the other two, but it is

HELP YOURSELF TO POULTRY PROFITS with HUDSON FEEDERS and FOUNTAINS

Famous HUDSON Kleen-Ezy* Feeders

Sloping sides keep feed sliding to bottom without packing in corners. Permit chicks to get up close to feeder. Feed-saving lip reduces "billing out." Non-roost reels or grill.

A. HUDSON CHICK FEEDERS
One-piece heavy galvanized steel. No seam. 3 sizes: 18-in., 24-in., and 36-in.

B. HUDSON CHICK and GROWING FEEDER
End stands quickly adjustable. 2 sizes: 36-in., and 48-in.

C. HUDSON BROILER FEEDER
Wing nuts permit easy height adjustment for chicks 2-weeks old up to broiler weight. Choice of hinged grill (shown) or reel.

D. FEEDER WITH FOLD BACK STANDS
End stands quickly adjust height for small or large birds. 48-in. with reel; 60-in. with grill.

Sanitary Ezy-Fill* Chick Fountains

Individual cups shaped into bottom pan prevent chicks from getting into and fouling water. Cupped pan fills twice as often as ordinary pan; keeps water fresher. One gal. and two gal. sizes.

Ezy-Fill Growing and Flock Fountain

To fill, just remove pan, reverse handle and use as pail! Easy to clean, handy to fill and carry. Special saucer shape pan. Makes drinking easier; prevents wading. 3 and 5 gals.

HUDSON Double-Wall Fountains

Patented air-groove lets air enter fountain without gushing. Self closing valve. 3 and 5 gal. sizes.

HUDSON Automatic Trough Waterer and Automatic Valve

At last—a foolproof, fully automatic valve! When trough is full, weight of trough and water pulls valve shut. As water is drunk, valve automatically opens to let water flow. Valve shuts automatically when trough is removed. Holds four quarts—use one for 500 chicks.

Automatic valve with chain also sold separately.

* TRADEMARK

SIGN OF THE BEST BUY

HUDSON

Tested and Proved
SPRAYERS AND DUSTERS
HAY TOOLS AND BARN EQUIPMENT
LIVESTOCK EQUIPMENT
FARM VENTILATION EQUIPMENT
POULTRY EQUIPMENT

H. D. Hudson Manufacturing Company
589 E. Illinois Street, Chicago 11, Dept. FQS-F

Please send me FREE catalog on Hudson's *full* line of Poultry Equipment.

Name .....
Address ..... or R.F.D. # .....
Town ..... State .....
Name of my dealer .....

more effective. The backs of the cattle are scrubbed with a solution consisting of 12 ounces of five per cent rotenone, one gallon of water, and one or two ounces of neutral soap or flakes. After the solution is thoroughly mixed it is sprinkled over the back of the animal and scrubbed into the grub holes with a stiff-bristled palmetto hand brush. As with the other methods, the scrubbing must be thorough and vigorous to open the holes and force the rotenone into the grub.

The treatment for grubs should begin within thirty days after they appear under the skin on the backs of the cattle. When they arrive under the hide -the small bumps can be felt by running the hand along the back. Later the swollen spots can be seen easily. The time of their first appearance in different sections of the country. In the extreme northern states they reach the back between February 1 and March 15; in the corn belt they may appear as early as December 15, and still earlier further south, to the southernmost tip of Texas where they have been observed as early as August 15. The nohtrern fly produces grubs that appear from a week to five weeks later than the common heel fly grubs. With both species the young larvae continue to reach the back for several months after the first have left the animal and become flies.

Occasionally young children have become infested with the cattle grub; one youngster had 14 taken from him. The result has been severe sickness and even paralysis, but fortunately, this infestation is rather rare.

The only other animals that are commonly attacked by the heel fly are buffalo and horses. Grubs that develop in horses do not reach maturity and no fly is formed. The small number of buffalo left do not create a serious control problem. Since the fly does not travel far, and since it does not find a host in other animals, there is hope for complete control of the pest.

One farmer can go a long way toward ridding his herd of the grub if he follows a careful schedule of treatments, but if his neighbors do not cooperate by treating their cattle there is a good chance of reinfestation. Recognizing this fact, Congress appropriated funds and authorized the Secretary of Agriculture to spend the money on research work on the grub and on an eradication program. Several of the states have also raised money for this purpose. In some European countries the government has made it mandatory for the farmer to carry on a systematic treatment for grubs. Here we are trying to eliminate this $100,000,000 a year pest by the voluntary efforts of the farmers aided by the government.

THE AUTHORS—Theodore R. Robb and Jack F. Schinagl, who collaborated on the writing of this article, are both associated with the Wyoming Agricultural Extension Service. Robb, who was born and educated in Kansas, is the Extension Service entomologist; Schinagl, who hails from Illinois, is Extension Editor and Information Specialist for the state.

NEW 1950 TRACTOR

$500.00 VALUE NOW ONLY... $395.

- 4½ Horsepower
- 6 Wheels
- 3 Speed Transmission
- Cushman Engine and Clutch

Factory Shipment Eliminates Middleman

IMPROVED LARGER MORE POWERFUL

Just off the production lines! The new, work-saving 4-1/2 horsepower Defiance Tractor . . . brings you all the big tractor features. Six hard-pushing, deep-gripping rubber tired wheels roll over planting "headaches". It has a genuine Cushman Engine and Cushman Clutch—for peak performance and trouble-free operation at the lowest possible cost. Complete with a power-packed 3-speed transmission and gear shift—2 forward speeds and one reverse.

SMALL FARMERS . . . NURSERYMEN . . . LARGE HOME AND ESTATE OWNERS! This tractor was *made for you*. It's simple and easy to operate. A bargain at twice the price! Order direct and save.

Write immediately for your NEW 1950 Defiance Tractor

REPRESENTATIVES WANTED

DEFIANCE TRACTOR CO., Dept R ENGLEWOOD, NEW JERSEY

AVOID WEANING TIME SETBACKS— BY FEEDING, TUXEDO PIG MEAL!

Pigs fed Tuxedo Pig Meal in addition to the sow's milk, beginning at three weeks of age, avoid weaning time setbacks. They get all the extra vitamins, proteins and minerals in the correct proportions so necessary to fast, sturdy growth and early gains. And as you know, it is those early-gaining pigs that become the profit-making hogs.

Feed Tuxedo Pig Meal to the sows also, before and after farrowing. They'll tend to produce stronger litters and have more milk for their pigs.

Ask your Tuxedo dealer for Tuxedo Pig Meal. It is now reinforced with A. P. F. Supplement for maximum results. Ask also about the other high quality Tuxedo hog feeds—Tuxedo Big Forty, Tuxedo Porkmaker and Tuxedo Hog Ration.

The Early & Daniel Co.
Cincinnati, Ohio • Established 1881

THE FEEDERS' TUXEDO FEEDS SILENT PARTNER

TUXEDO HOG FEEDS

BUY WITH CONFIDENCE • FEED WITH PRIDE

THE FORAGE CHOPPER

(Continued from page 75)

methods which involve picking up the hay crop, hauling it to the silage chopper, chopping it and then blowing it into the silo. With corn, the forage harvester has a row crop head that cuts the corn, runs it through the chopper and blows it into the trailing wagon. The time and labor saving of this method over the old binder, silage chopper, blower way has been figured by Charles Belden of Allegan, Michigan, who cuts 55 acres of corn for silage each year. Belden says that with the harvester, "we do the work in a third less time than before, and it isn't half as hard work."

In making grass silage the usual method is to cut it and leave it in the swath to wilt down to about 68 per cent moisture before picking it up with the harvester. A variation on this method, which saves still more time and labor, is to use a cutter bar attachment on the forage harvester so that the hay crop may be cut, picked up, chopped and loaded onto the wagon in one operation. Since this method leaves the chopped silage too wet for safe storage, dry corn cob meal is added as it is blown into the silo to bring the total moisture content down to 68 to 70 per cent.

Many farmers find the harvester particularly useful in keeping their pastures

THE WORLD'S LARGEST MAKER OF AUTOMATIC PICK-UP BALERS ANNOUNCES

Make More Forage Faster With The NEW HOLLAND Forage Harvester

From field to wagon to silo or barn in one operation . . . saves time—saves labor—saves expense—saves crops!

Look at these features

- New Holland slicing action grips material while it cuts. Knives draw down and across cutter bar *toward power source*. Slices like a knife—does not squeeze forage as in ordinary scissors-type machines. New Holland cuts clean, uniform lengths from $^{3}/_{16}$ in. to 4 in. by simple, quick adjustment. Uses less power—cuts more forage faster.
- To change from row to windrow attachment, or vice versa, remove and replace only 5 bolts and a sleeve coupling.
- Sturdy, strong but light weight due to simplified design. Plenty of power from only 30 h.p. motor.
- Three-point weight distribution keeps the forage harvester from raising in front while working uphill.
- Exclusive toothed, crawler-type, upper feed roll synchronized with apron insures positive feeding through extra large, 112 sq. inch throat opening.
- Controls in easy reach of tractor seat include: Start-stop-reverse lever—deflector control—pick-up or gatherer control lever.
- Hinged tongue allows 5 ft. maximum lateral shift.
- Universal type tractor hitch fits all tractors.
- All moving parts enclosed or shielded.

NEW HOLLAND Forage Harvester with row crop attachment

New Holland Forage Harvester with single row gatherer and sickle bar cutter—two pairs, synchronized gathering chains. Extra-wide gathering points make unit easy to guide.

NEW HOLLAND Heavy Duty Forage Blower

Pile your forage onto your New Holland Heavy Duty Blower with its extra-long feed table—and watch it go w-h-o-o-s-h up the 8" pipe—5 to 20 tons of hay per hour . . . 10 to 25 tons of corn per hour.

NEW HOLLAND'S "New Angle" Ensilage Cutter and Hay Chopper

Uses same "new angle" cutting principle as the New Holland Forage Harvester—positive feeding—extra-large 112 sq. in. throat opening—10 cutting lengths. Start-stop-reverse feeding levers on either side.

Buy New Holland Products only from an Authorized New Holland Dealer. He will give you competent service and genuine parts. Mail the coupon today!

NEW HOLLAND

Today's Leader in Grassland Farming

New Holland Machine Co., New Holland, Pa.
A SUBSIDIARY OF THE SPERRY CORPORATION
Minneapolis • Des Moines • Kansas City • Toronto

Free

New Holland Machine Company
904 Elm St., New Holland, Pa.
Please send me free catalogs on the New Holland Products checked below:

- ☐ Forage Harvester
- ☐ Hay Pick-Up Row Crop Attachment
- ☐ Side Delivery Rake
- ☐ Hay Chopper-Ensilage Cutter
- ☐ Pick-Up Baler
- ☐ Bale Loader
- ☐ Baler Twine
- ☐ Forage Blower
- ☐ Hammer Mill
- ☐ Farm Wagon
- ☐ Cylinder Corn Sheller
- ☐ Portable Tractor Saw
- ☐ General-Purpose Mixer
- ☐ Manure Spreader

Name_____

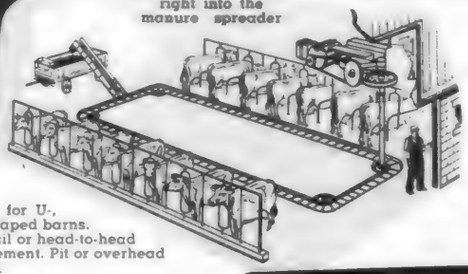
Street or RFD_____ County_____

City and State_____

WHY DO IT THE HARD WAY?

JUST FLIP A SWITCH

Litter is conveyed right into the manure spreader



Adaptable for U-, T-, or L-shaped barns. Tail-to-tail or head-to-head arrangement. Pit or overhead power.

Would you go back to hand milking? To hand plowing? Hand water-pumping? Hand this and hand that? Certainly *NOT!* Then why continue hand barn cleaning — when a Leach Barn Cleaner will do the job for you by merely *flipping a switch.* And do it *right!*

PLAN TO INSTALL — NOW

Now — during the coming months is the best time to install your Leach Barn Cleaner. You will want an estimate. This the nearest Leach dealer will give you without obligation. Just tell us on a post card that you're interested.

LEACH CO., 450 S. Main St., Oshkosh, Wis.

LEACH Barn Cleaner

Also manufacturers of the famous Leach Silo Unloader

HOLD EVERYTHING!

LET *Bready* DO THE WORK!

Choice of 1½ or 2½ HP models

BREADY GARDEN TRACTOR does your gardening, mows your lawn, trims weeds, plows snow—plus many other chores. Here is the all-purpose small tractor you will use the *year around* — yet it costs less than many power lawnmowers!

Powerful, yet economical to run. Easy-guiding, with wheel ratchets for extra-short turns. Complete line of all-purpose implements. Also use as mobile power plant with power take-off. "BREADY" — a famous name in garden tractors for 30 years.

FROM ONLY $149.50 F. O. B. FACTORY

Write today . . . for free folder and name of dealer

THE BREADY TRACTOR & IMPLEMENT CO.

BOX 202 SOLON, OHIO

clipped in the late spring when the crop grows faster than it is pastured. In this way they save the crop from becoming stemmy and losing part of its food value and also turn the clipped hay into silage to be fed later in the summer when the pastures are poor or still later when they are non-existent.

Better and More Feed

Chopping the hay doesn't add a single vitamin or calory to the nutrients that are already there. The different methods of preserving the forage crop and the time at which the crop is harvested, however, result in a wide variance in the food value. The advantage of the forage harvester is that it can be used economically in each of the hay preserving methods and also makes it possible to harvest the crop more quickly, bringing it in when it reaches its peak in nutritional value.

Field cured hay does not gain any nutritional value from chopping, but it has been found that in feeding chopped hay the stock will clean up the coarser stems which they would pass up if served long. Care should be taken, however, to see that the chopper is set for a cut of not less than two inches because shorter lengths are harder to handle, have a tendency to be excessively dusty, and irritate the mouths of cattle and sheep.

For ages farmers have tried to make hay while the sun shines, but the 25 to 50 per cent loss of food value that they suffer has turned many of them to mow drying or curing in the haymaker where air, either heated or unheated, is blown through the hay to relieve it of its moisture. The loss suffered in field curing the hay comes through the shattering of the dry leaves and from the leaching of nutrients by sun and rain. The loss from shattering is particularly great in arid regions where the hay dries quickly. In Colorado, for instance, it was found that under favorable conditions there was a loss of 350 pounds of leaves, the most nutritious part of the hay, for each ton taken off the field. When the hay was allowed to become too dry, the loss mounted to 1,000 pounds to the ton. A good heavy rain on the nearly cured hay, on the other hand, can leach out 45 per cent of the protein that could have been saved by mow curing. But even under the best of conditions for field curing, the artificial drying of the hay will save 13 per cent more dry matter and 16 per cent more protein. And when the farmer figures up the cash that he spends for supplements to make up this protein loss he will agree that that ain't hay. The total protein that the hay will contain will vary with the crop mixture that has been planted, the fertility of the soil, the time of harvest, and whether the harvesting method preserves the leaves. The digestible protein in alfalfa hay will run from 10.5 per cent for average hay

to 13.7 per cent for leafy hay that has been cut early.

Ensiling the hay crop, a job that the forage harvester is peculiarly equipped to perform, is the best method we have for retaining the food value in storage. Over a year's time the silage will preserve over 100 units of carotene of the 200 to 300 in the original crop, whereas the dry hay will retain but 10 to 15 units. This process will average a saving of 9 per cent more dry matter and 20 per cent more protein than good field cured hay.

When a man marries he finds that the cost of the house is only the beginning in setting up a home. The cost of a forage harvester is only one part of the equipment that is necessary to bring in the chopped hay or silage. In addition,

CHOPPING COMPRESSES hay to half space.

the farmer will need enough wagons or trucks to keep the hay moving back to storage and the harvester in constant operation. This is usually figured as three or four wagons or two or three trucks, depending on the distance from the field to storage. If wagons are used, an extra tractor will be needed in addition to the tractor used with the harvester.

Automatic unloaders can save a great deal of labor and cut down on the number of wagons needed. Several successful methods have been devised for moving the crop off the wagon-bed without too much use of muscle and pitch fork. One is a canvas strip the length of the bed that is fastened to a roller at the end. A motor then turns the roller and draws the load off the wagon. A false end gate has also been devised that can be drawn back against the load by cables to force the load off the bed. Dump trucks are often used for this job and some farms have rigged up a winch that will lift one end of the wagon to produce the same effect. However, one extra man, in addition to the driver, can unload by hand fast enough for the ordinary blower.

To put the chopped hay into a barn, silo or stack, a blower or farm elevator is used. One manufacturer has combined the unloading and blowing operation by producing a vacuum hose that sucks the hay off the load and delivers it into the barn or silo. Power for the blower is secured from an accessory engine or from a third tractor.

GEHL
SINCE 1859
PRONOUNCE IT "GALE"

Sells more

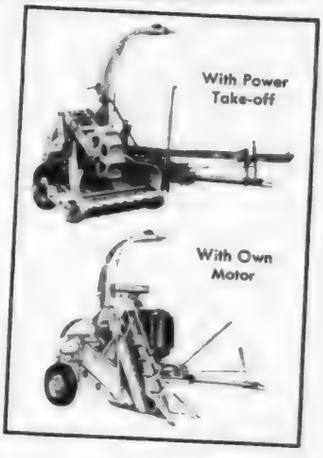
Forage Harvesters

than any other specialized manufacturer!

● Gehl was one of the *first* to develop a forage harvester, and the first Gehl built, over seven years ago, is still operating successfully. *Thousands of users* agree that the Gehl Forage Harvester leads in better cutting, all-'round performance and *value per dollar*. Its superior cutting ability is inherited from Gehl feed cutters and silo fillers famous for half a century. It does an equally fine job in either windrowed hay or standing corn. The Gehl is built to stand up year after year.

An official survey reports that each field forage harvester used "saved 390 man hours . . . more labor saved per machine than any other type of harvester."

Compare the Gehl, ask a Gehl owner, and you'll choose a Gehl. The Gehl is powered either with its own motor . . . or a power take-off from tractor.

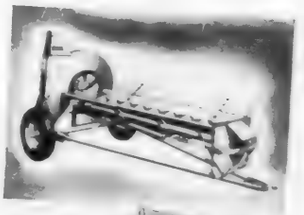


Gehl Equipment Does The Complete Forage Job From Field to Storage

Gehl Forage Blower elevates any forage into highest silo or mow. Can be equipped with power take-off to operate new Gehl Self-Unloading Wagon, and others. You can get . . .

Free Plans FOR MAKING YOUR OWN WAGON with self-unloader, using Gehl parts kit of complete iron work. Illustrated plans give full details, measurements, etc.

MAIL COUPON today for FREE wagon plans and for big, colorful FREE BOOKLET. Find out why Gehl sets the pace . . . read what users say.



Parts Kit for building self-unloading wagon

GEHL BROS. MFG. CO., Dept. MC-591, West Bend, Wisconsin

Without obligation, you may send me literature as checked below:

☐ Wagon Plans ☐ Booklet on Forage Harvester

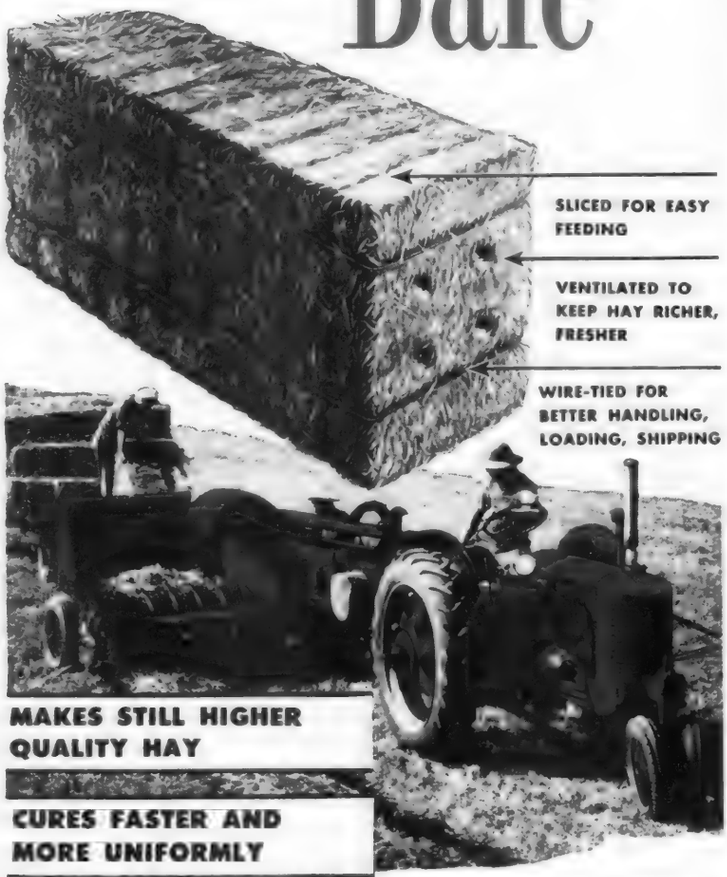
Name .....

R.F.D. or Street Address .....

City ..... Zone..... State .....

THERE'S NOTHING BETTER THAN A GEHL

New CASE Ventilated Bale



MAKES STILL HIGHER QUALITY HAY

CURES FASTER AND MORE UNIFORMLY

SAVES MORE NUTRIENTS, VITAMINS, MINERALS

The Case Slicer-Baler for 1950 puts up ventilated bales—and it's the only baler that does. It's a proved baler, already used by more farmers than any other. And remember—it's the slicer-baler that costs less to own.

For two years an agricultural college compared ventilated bales and ordinary bales, side by side. The tests included different lots of hay, and a variety of weather—some of it very poor for hay curing. Expert hay graders did the judging. They found that the ventilated bales averaged consistently higher in grade.

Plan now to feed hay of still higher quality . . . save grain and concentrates . . . put more meat on the ribs and more milk in the pail. See your Case dealer now; learn how little it costs to have your own Case Slicer-Baler, avoid loss of leaves and quality while waiting on others. Use the coupon, today.

PASTE ON PENNY POST CARD FOR FREE BOOKLETS

Mark machines that interest you; write in margin any others you may need; mail to J. I. Case Co., Dept. C-90, Racine, Wis.

- ☐ Slicer-Baler
- ☐ Trailer-Mower
- ☐ Tractor Rake
- ☐ Heavy-Duty Baler
- ☐ Light Power Baler
- ☐ 3-Way Elevator
- ☐ Forage Harvester
- ☐ Forage Blower
- ☐ Hammer Mill

NAME _____

POSTOFFICE _____

RFD _____ STATE _____

The forage harvester itself has two accessories that most farmers will feel are essential, the windrow pickup and the row crop attachment for cutting and chopping corn. Some converts to grass silage will dispense with the row crop attachments entirely. One of these, a dairyman, said, "I absolutely refused to buy the row crop fitting. I use only hay silage here on the place and I'm so satisfied with it that I won't ever put up any corn silage. So if I had the corn attachment all it would bring me is trouble. All my neighbors would be after me to fill their silos and I just haven't the time, but I wouldn't have the heart to refuse them if I had the equipment to do it with."

He will need his old mower and a side delivery rake, but if he can find a buyer, he can sell the buck rake, hay forks, slings, corn binder and silage chopper that were part of his old equipment.

Types of Harvesters

The forage harvester comes in two general types and several sizes within these types. The least expensive are those that are operated from a power take-off from the tractor; for heavier faster jobs the harvesters come with their own engines, but at a higher price. Delivered prices are difficult to quote since the delivered price will depend on the freight charges that must be added to the original cost. The factory prices for the harvester equipped with both windrow pick-up and row crop attachment range from $1330 to $1835. With their own power, harvesters with the same accessories run from $2010 to $2991.

Most companies who manufacture harvesters also make blowers for putting it into the barn or silo. These range in price from $325 to $566. Wagons equipped with self-unloading devices run from $450 to $500, but the materials that a farmer would need to convert an old wagon cost only $75 or $80.

Among the manufacturing companies who produce forage harvesters are: Allis-Chalmers Mfg. Co., Milwaukee, Wis.; J. I. Case Company, Racine, Wis.; Davis Manufacturing Inc., Wichita, Kansas; Deere & Company, Moline, Illinois; Fox River Tractor Company, Appleton, Wis.; Gehl Bros. Manufacturing Co., West Bend, Wisconsin; H. D. Hume Company, Mendota, Ill.; International Harvester Corp., Chicago, Ill.; Massey-Harris Co., Racine, Wis.; New Holland Machinery Co., New Holland, Pa.; and Papec Machine Company, Shortsville, N. Y.

Can I Afford One?

The problem that each farmer faces is whether or not the investment in this machinery will pay off on his farm. Attempts have been made to find the minimum point at which a forage harvester becomes an asset rather than a liability. In terms of acreage, one of the researchers estimates that 20 acres of row crops for silage and 40 acres of hay should be considered a minimum figure for the economic operation of the harvester. In terms of hay tonnage, a minimum would be 160 tons. In terms of usage, it is felt that the equipment must be used at least seven to ten days a year. If it cannot be used this much on the owner's farm he would be better off to have his work done by custom operators or secure enough custom work himself to fill out the schedule. The usual rate for custom work is $7.00 an hour in hay and $8.00 or $9.00 an hour for corn for which the operator furnishes the forage harvester, blower, three self-unloading wagons, one tractor and the labor of one man. In some sections the price runs as high as $12.00 for the work and in others it may be a bit cheaper. The great drawback to having the work done by custom operators is that everyone wants them at the same time which means that some farmers don't get their work done when the crop is ready.

Most agricultural engineers feel that the forage har-

vester offers the best solution for gathering the forage for hay or silage today. Though it is the last word in hay gathering, the machine has some disadvantages. The initial cost for the harvester and the accesory equipment is comparatively high to begin with. On some farms where the land is rough and has many surface stones, the machine is impractical since a rock in the chopping mechanism will put a stop to further operations until repairs are made. Farmers complain that the chopping mechanism needs daily adjustment to keep in operating trim. The chopping of dry hay is a dustier job than handling it in other ways. And, finally, the blower, which works well with dry hay and silage, has a tendency to clog up when semi-cured hay is being blown into the barn for drying.

More than balancing the objections to the harvester are its advantages which include its versatility, being able to handle any of the methods devised for storing hay as well as chopping row crops for silage and chopping straw for bedding. The harvester requires less hours per ton of hay put up and less physical labor is called for in the process. On a large tonnage basis it is the cheapest method of harvesting the crop. By simplifying the process of gathering in the hay crop for barn curing and ensiling, it becomes possible to actually gather more hay from the same acreage and to store more of the nutrients in the hay that has been gathered.

These are the answers to the questions that the farmer asks about a forage harvester when he contemplates buying one. But they are given in very general terms that won't fit any specific farm. Farmers use their machinery with widely varying degrees of efficiency. As one study showed, the differences in time and labor expended on hay making were greater between farmers using the same equipment than between farmers using different machinery.

The guide post is set at 40 acres of forage crops and 20 acres of silage as a minimum, but some clever farmer is sure to be able to make out with only 50 acres total for these crops and others, not so clever, will use the machine inefficiently on 180 acres of them. In the last analysis, the man is more important than the machine. Man makes the machines all alike; nature made all men different.

FARM FIRES (Continued from page 62)

extinguisher have no affect on the fire; they merely provide the pressure to squirt water onto the fire. In the winter they must be protected against freezing temperatures. Hand pumps and water pails can be kept from freezing by calcium chloride used as an anti-freeze at the rate of four pounds to each gallon of water, which will prevent freezing in 20 below zero weather.

Unlike the soda-acid extinguisher, the loaded stream fire equipment depends on chemicals mixed with the water to put out the fire. In addition to the cooling action of the water, the chemical seals off wood and other inflammable material to shut off the source of fuel supply. The loaded stream is rated much more effective than the same amount of water. It will remain liquid down to 40 degrees below zero and does not need recharging each year as does the soda-acid extinguisher. Checking the loaded stream extinguisher is done by weighing the cartridge. An added advantage is that this agent can be used on small gasoline and oil fires where water would only increase the danger.

The unit cost of fire equipment varies widely with the amount that is purchased and also varies in different sections of the country. Approximate list prices for single pieces of this equipment are: $30.00 for the 2½ gallon soda-acid extinguisher, $26.00 for the 2½ gallon pump tank, $29.00 for the 5-gallon pump tank, and $44.00 for

New CASE 3-Way

FIELD FORAGE HARVESTER

CORN SILAGE . . .

Built from the ground up for both row crops and hay crops, the Case Forage Harvester takes care of all needs on farms having both hay and silage. With row-crop unit in good corn or sorghum, under average conditions it cuts 12 to 18 tons an hour, depending on yield and size of tractor used.

CHOPPED HAY . . .

For making chopped hay, either fully cured in the field or partly cured for barn finishing, the windrow pick-up unit does a clean job. The all-steel knife wheel keeps on spinning to clear itself, avoids plugging. Over-running clutch prevents "pushing," lets knife wheel come up to speed before starting travel.

GRASS SILAGE . . .

The same strong, clean-working windrow pick-up handles hay cut for silage and wilted to the desired degree—enables you to save hay by ensiling when bad weather prevents curing. Cutter-bar unit will be available in limited numbers; it saves still more work in conditions where wilting is not needed.

New FORAGE BLOWER

This new Case blower has capacity to keep ahead of forage harvester. It puts up to 30 tons an hour of corn silage into a 60-foot silo when belted to a 3-plow tractor; also works well with 2-plow power. Spring-hinged hopper lets you drive right by—no backing with loads. Ratchet-driven wagon unloader available as an extra.

● The Case 3-way field forage harvester is easy-running—makes good use of 2-plow power, yet has capacity and mechanical strength to use the power of bigger tractors. All three crop units can be hydraulically controlled. With a Case blower and forage harvester you're equipped for all kinds and all forms of forage—whether you put grass or row crops into your silo, whether you cure hay in the field or mow. Send coupon, get full information.

PASTE ON PENNY POST CARD

Mark machines that interest you: write in margin any others you need; mail to J. I. Case Co., Dept. C-90, Racine, Wis.

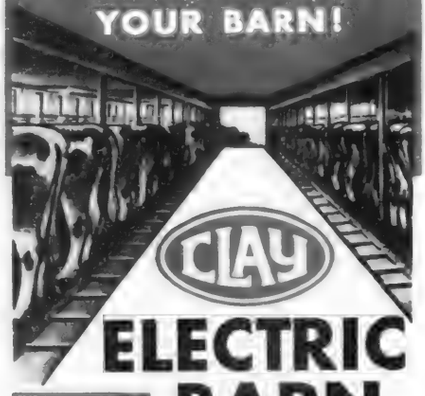
- ☐ Forage Harvester
- ☐ Forage Blower
- ☐ Slicer-Baler
- ☐ Trailer-Mower
- ☐ Tractor Rake
- ☐ Heavy-Duty Baler
- ☐ Light Power Baler

NAME_____

POSTOFFICE_____

RFD_____ STATE_____

NOW POSITIVE, FOOLPROOF AUTOMATIC CLEANING FOR YOUR BARN!



CLAY

ELECTRIC BARN CLEANER

DIRECT LOADING

NOW—Free yourself from the hardest back-breaking barn drudgery with a CLAY GUTTER CLEANER. Keep your help happy and hold your boys on the farm. THE "CLAY" IS LOW COST—INSTALLS EASILY, WIPES CLEAN. *Facilitates Grade A Approval.*

8 LOCATION CHOICES

● Flexible design adapts easily to old barns or new. Needs little concrete work. Choice of 8 spreader loading positions.

FEWER MOVING PARTS

● Only *ONE motor*—only *ONE continuous super-strength chain*—only *ONE simplified drive unit* for longer life—trouble-free operation, low cost installation, negligible maintenance. High strength alloy steel chain is rust resistant—won't stick—has ultimate strength of over 10 tons.

PITLESS—LESS ODOR

● Manure moves smoothly, evenly, without disturbance. Special flat top paddles—12" apart—sweep all liquids and solids from gutter direct to the spreader. No churning or falling back of manure at elevator. *No foul pit inside or outside.*

DOUBLE GUARANTEE

● FIRST—Your choice to send it back in 90 days with full refund of money and freight. SECOND—Full guarantee against defective parts for 1 year.

☐ GALVANIZED WINDOW FRAMES

Tilting Ventilating Low Cost Install Yourself 4 Sizes

☐ BARN WINDOWS VENTILATING

All Steel Tilting No Draft Weather Tight 5 Sizes

Check and mail TODAY for big FREE illustrated catalogs. Find out why Clay is better.

☐ Farm Building Ventilation
☐ Windows & Frames
☐ Stalls & Stanchions
☐ Milking Parlor Stalls
☐ Bull Pens
☐ Water Bowls
☐ Litter Carriers
☐ Silage & Feed Trucks
☐ Steel Gates
☐ Hog House Pens & Equipment
☐ Roof Ventilators

Clay Equipment Corporation
251 Fulton Street
Cedar Falls, Iowa

Rush FREE barn cleaner literature plus catalogs on above checked items.

NAME_____

TOWN_____

STATE_____ RFD____

the 2½ gallon loaded stream appartus. Purchasing enough of these extinguishers to place them properly (one 2½ gallon extinguisher for every 2500 feet of floor space as a bare minimum) will run into a little money ,but if a fire can be stopped before real damage is done, the money will be well spent.

If the fire gets out of hand, more water will be needed. Fire engines can pump 1500 gallons a minute. With smaller hoses and water saving devices the gallonage can be held down to 100 gallons a minute. Hydrants, wells, farm ponds, dammed-up streams, and special fire cisterns will all serve to provide plenty of water if they are located near the buildings and if they can be reached with a pump. A round cistern eight feet in diameter and eight feet deep will provide a reserve of 3,008 gallons of water which should be enough to handle any farm fire if caught in its early stages.

Clement Cook, who lives a few miles from Hannibal, Missouri, ran into the water shortage problem when his barn caught fire. Since his farm was covered by a contract with the town fire department, he was able to phone them and get immediate action. The fire engine pulled into the yard a few minutes after he had called while his oldest son was still getting the skittish horses out of the barn. The firemen dropped their suction hose into the open well, started their pump, and were playing a good stream of water on the base of the fire when the well ran dry. It took just three minutes to pump the well dry; after that it was just a matter of watching the barn go up in smoke and trying to protect the other buildings with hand extinguishers.

When Mark's seed house fire was first discovered, Chief Hall of the Washington Court House Fire Department estimated that the fire could have been put out with a hundred gallons of water and a little equipment. Without it, he had to stand by and watch the building burn to the ground. "Lack of water," Hall says, "is the reason most farm fires end up in complete destruction of the buildings."

Underwriters' Laboratories, 207 East Ohio Street, Chicago, Illinois, publishes lists of approved electrical equipment, gasoline, oil, and miscellaneous appliances, and fire fighting equipment. Further information on fire prevention, fire, fighting methods and equipment can be secured by writing to National Board of Fire Underwriters, 85 John Street, New York 7, New York; U. S. Department of Agriculture Safety Council, Washington, D. C.; National Safety Council, 20 North Wacker Drive, Chicago 6, Illinois; National Fire Protection Association, 60 Batterymarch Street, Boston 10, Massachusetts.

Two devices have been found which will stretch a limited water supply, the fog nozzle and water wetter. The fog nozzle atomizes the water so that it can be played on the fire in a fine mist that not only lowers the temperature, but acts as a smothering agent. Low pressure fog nozzles can be secured which will work well on regular farm power sprayers and make the water do twice the work in fighting fires.

GIANT-SIZE extinguishers come on wheels.

A strange chemical that makes water still wetter by adding to its penetrating power is put out by many chemical companies. When mixed at the rate of 1 part chemical to 200 parts water it will penetrate hay or straw or any other material that normally turns water. Even a duck, which depends on its water-proof feathers for buoyancy, will sink in such a solution.

Any farmer who owns a power sprayer is missing a bet if he does not keep it in readiness as a piece of fire fighting apparatus when it is not being used as a sprayer. At very little cost, the sprayer can be equipped with an extra length of hose and with a medium or low pressure fog nozzle. A small quantity of the water wetting chemical can be kept handy to be dropped into the tank in case of an emergency. The chemical will not corrode the metal parts, but has a tendency to remove rust proofing material and therefore should be flushed out of tanks and pumps after use.

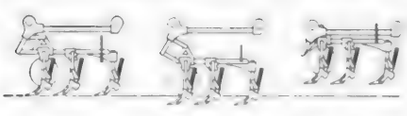
Class B Fires

Fires that involve flammable liquids such as gasoline, kerosene, diesel oil, paint thinners or insecticides are grouped into Class B. These fires feed on the surface vapors rising from the liquids. Since water, instead of cooling the burning material, spreads it, these fires are fought by cutting off the oxygen they must have to keep burning. Fire extinguishers have been designed to fight these fires with carbon dioxide gas which, being heavier than air, blankets the fire; with dry powders that give off carbon dioxide gas; and with

Raise Row Crop Profits with an OLIVER Row Crop!

An Oliver Row Crop tractor is your perfect choice for planting and caring for a wide variety of row crops. Its six forward speeds give you the proper working pace for any practice. Conveniently grouped controls and a revolutionary rubber torsion spring seat provide unequalled comfort and handling ease . . . enable you to stay on the job longer and accomplish more.

See your Oliver dealer before spring field work begins. From the full line of 31 Oliver Row Crop matched implements and attachments, you can select the mounted equipment that meets your exact needs. What's more, these mounted tools are basically interchangeable among the Oliver "66", "77" and "88" models. The Oliver Corporation, 400 West Madison Street, Chicago 6, Illinois.



A parallelogram coupling keeps Oliver tractor mounted tilling, planting and cultivating tools on an even keel. These diagrams show how the gangs stay level and are permitted to float independently.

The Oliver Corporation F3-3
400 West Madison Street, Chicago 6, Ill.
Please send me literature on
( ) Row Crop tractors. ( ) Mounted tools.

Name.....

Post Office.....

Rural Route.....*State*.....

OLIVER

"FINEST IN FARM MACHINERY"

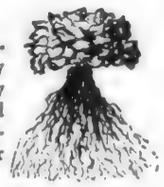
Oliver "66", "77" and "88" tractors are built in 6 basic types and 8 variations

We guarantee you'll pick these

EVERBEARING STRAWBERRIES

IN 90 DAYS

FAMOUS GEM EVERBEARING. Stern's takes the risk out of gardening. You'll pick these big juicy strawberries by July—or your money back! Every plant unconditionally guaranteed to bear—will start by July and continue bearing until freezing weather. Big, firm, round berries. Extra juicy, extra rich flavor, very sweet. Make mouth-watering short-cakes, pies, jam, irresistible with cream. Next year and after they'll bear earliest and continue right up to freezing time.



Thousands of feeders on thick fibrous roots. Stern's plants produce fast, heavy crops.

GEM EVERBEARING	50 for	250 for	1,000 for	POSTPAID
Selected highest quality Thick heavy roots	$3.00	$12.00	$30.00	Fresh plants shipped from fields closest to your home.

JUNE-BEARING VARIETIES—Guaranteed to grow and bear. Choose from these popular varieties:
PREMIER • CATSKILL • SPARKLE • FAIRFAX
50 for $2.00, 100 for $3.50, 250 for $6.00, 1,000 for $18.00 postpaid

FAMILY STRAWBERRY GARDEN—GROUP No. 30

An ample supply for the average family—for fresh fruit as well as for canning.

250 plants {50 each of Gem, Catskill} {Premier, Fairfax, Sparkle} **only $8.00** postpaid

UNCONDITIONAL GUARANTEE—SATISFACTION OR YOUR MONEY BACK. Stern's guarantees these plants unconditionally for one full year. If, for any reason, you are not delighted with these quality products, purchase price will be refunded promptly. You need NOT return the plants.

Order NOW for Immediate Delivery. Send Cash or order C.O.D.

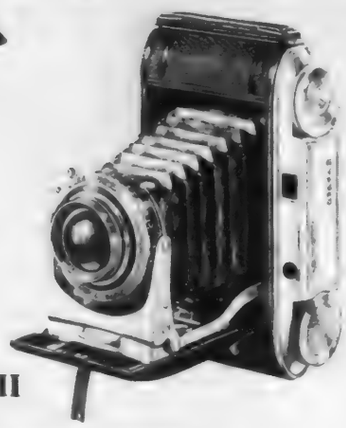
STERN'S NURSERIES, DEPT. K, GENEVA, N. Y.

Announcing!

Voigtländer's finest

2¼" x 3¼" Roll Film Camera

THE NEW RANGEFINDER BESSA MODEL II



We unhesitatingly recommend this new Voigtlander as one of the finest 2¼" x 3¼" roll film cameras we have seen in our 51 years of experience.

With Color-Skopar Lens $115.00
With Heliar Lens $152.50
De Luxe Eveready Case ... 8.50

It has among its features:

- Combined viewfinder and rangefinder of superimposed image type.
- Focusing by moving complete lens.
- New Compur Rapid Shutter. Speeds 1 sec. to 1/400th second.
- Flash Gun Synchronization built-in.
- Streamlined for easy handling.
- Rich Satin Chrome finish.
- Genuine leather covering.

Available at your dealer or

Willoughbys

WORLD'S LARGEST CAMERA STORE
EXTENDING A FULL CITY BLOCK
110 West 32nd Street • 113 West 31st Street
New York 1, N. Y. LOngacre 4-1600

foam that smothers the fire. The foam type extinguisher is considered to be the most reliable since any breeze or draft can blow away the gas and fan the flame, but foam will stay put. Equipment of this kind should be kept with the tractors and near the gasoline storage area. Fog or fine spray from a power sprayer can also be used to fight Class B fires.

Foam equipment costs around $32.00 for the 2½ gallon size. The carbon dioxide extinguisher is sold by weight, running from $22.00 for the 2½ pound size to $350.00 for the 100 pound wheel mounted extinguisher. The dry chemical powder agent also sells by the pound at $42.50 for the 10 pound size, which is equipped with a gas cartridge for expelling the powder. These prices, like those quoted above, are for single pieces of equipment and should be considered to be maximum prices since it is customary to grant discounts with larger purchases.

Class C Fires

Class C fires are those involving electrical equipment. With this type of fire there is always the extra hazard of electrical shock, especially where high voltages are present. For this reason, water, which is a good conductor of electricity, should never be used. Non-conducting gas, powder, and vaporizing liquid extinguishers, such as are used to fight Class B fires, are used on electrical fires. An added advantage in using them is that they do not cause any further damage to the equipment that is burning. In fighting a Class C fire, the first job is to shut off the electricity, if that is possible.

Sound the Alarm

The earlier a fire can be detected and fought, the better the chance of saving the property. As one fireman said, "I could put out most fires by spitting on them if I was there when they started." Many farmers are installing electric fire alarm systems in their buildings which will sound an alarm when the temperature rises to 135 degrees. With night fires, the alarm gives a farmer a chance to go into action before he is awakened by the roar of flames or a call from a neighbor.

The first shock of finding a building on fire usually upsets most people; they throw the baby out of the window and carry the featherbed carefully downstairs. As a guide to calm action many farmers have worked out a procedure, posted in a handy place, to be followed in case of fire. Such a procedure would read: (1) Call the fire department. (2) Call neighbors who have fire fighting equipment. (3) Post a member of the family on the road to keep volunteers from blocking the road with their cars or from blocking off the water sources. (4) Start fighting the fire.

Neighbors who answer fire calls should remember to bring their extinguishers and to load on as many milk cans filled with water as they can get in their cars or trucks.

But what if the fire department refuses to help because the farm is out of their contract district? That was what happened at the Mark fire. When Mark returned from Iowa to find his seed house a mass of charred debris, he and his neighbors decided to do something about securing better fire protection for their farms. A local committee was formed to start the investigation. They planned to arrange for an extension of the coverage of the nearest town fire department to include their farms, an arrangement that has worked very well in many areas. Farmers throughout the whole county took an interest in the work, however, and very shortly the committee grew into a county-wide fire protection association. Meetings were held with the State Fire Marshal and the fire chiefs of the various towns in the county. At these meetings plans were made for expanding the coverage of the established departments to take in the whole county. Extra equipment for this work, which consisted mainly of water tank trucks and short wave radio equipment for speedy communication, was listed and its cost tallied. They found that the legal difficulties involving protection for men and equipment could be ironed out with covering contracts and that even volunteer firemen could be brought under the workmen's compensation act.

To finance the program, the association sponsored a one mill tax levy in each of the townships in the county. At present the levy has passed in three townships, but will have to be reintroduced in three others where it failed to receive 65 per cent of the votes required for passage. Fortunately, the three it passed are grouped together and the program can be started there without waiting for the other three to join. There is a lot of work involved in getting the program underway, but these farmers are encouraged by the examples of Colefax County, Nebraska, and Lepeer and Kent Counties in Michigan, where such programs have been perfected.

"We started talking about our program the night I got back from Iowa after the fire, when everybody was interested," Mark says. "That's the time to push a thing like this. As one of the fellows said then, 'If we're going to get this thing started, we'd better do it tonight; by tomorrow no one will be interested.'"

While plans for county-wide fire protection are being completed, Mark and his neighbor, Sam Marting, have set up a fire prevention program on their two farms. Hand extinguishers of the proper type have been purchased and set up at strategic spots on each of the farms. Jointly they have purchased a 150-gallon, self-powered sprayer for use on the two farms. In the summer it is kept on Marting's farm where the danger from hay fires is greatest; in the winter, when Mark is drying seed corn, it is kept at his place. In the event of a fire at either farm, the equipment can be moved quickly.

"We could fight a fire on either of our places with the equipment we've got," Marting says, "but the main job is to keep a fire from starting. The only way to do this is to keep up a constant tough inspection and eliminate fire hazards. And that's just what I'm doing."

A somewhat more ambitious program inaugurated by the individual farmers and by cooperating groups of neighbors is the purchase of one of the new fire fighting trailers. The trailer carries ladders, ropes, hand extinguishers and a 200 gallon tank with 200 feet of fire hose. The pump itself with its gasoline engine can be demounted from the trailer and carried to water sources that the trailer can't reach. The equipment can be used with straight stream, foam, or fog nozzles. The whole rig can be towed by any car or truck with a trailer hitch.

But there is no fire fighting equipment that is better than a vigilant man who is constantly on the lookout for danger spots on the farm. Checking the lightning rods and electrical equipment, cleaning up trash and dry weeds, testing for heating in the hay mow, and insisting on safe storage of gasoline and oil will go a long way toward stopping the nine out of ten fires that are preventable. A fire that never gets started won't do any damage.

Which is really Rosalind Russell?

Spark plugs also look alike, but

AUTO-LITE

TRANSPORT
SPARK PLUGS

give you lowest cost per mile of spark plug operation

★ **AIRCRAFT TYPE INSULATOR**—improved electrical insulation offers maximum resistance to heat and reduces fouling.

★ **HEAVY ELECTRODES**—give long gap life which contributes to lower service costs by requiring less frequent gapping.

★ **RUGGED CONSTRUCTION**—makes them especially suitable for the most severe types of commercial and farm operation.

IF YOU know your stars of Hollywood, you will identify enchanting Rosalind Russell as the girl at the top. The other girl is beautiful Florence Williams of Brooklyn. You'll be correct, too, when you switch to Auto-Lite Transport Spark Plugs.

THE ELECTRIC AUTO-LITE COMPANY
Toronto, Ontario Toledo 1, Ohio
Auto-Lite Spark Plugs—Patented U.S.A.

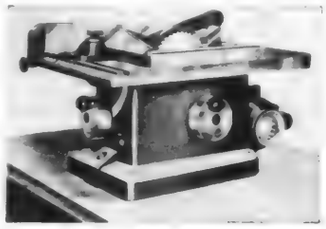
Tune in "Suspense!"... CBS Radio Thursdays ... CBS Television Tuesdays

With **BLUE STAR**

WONDER WOODWORKING POWER TOOLS

Plenty of woodworking jobs on the farm... and here are the tools that'll make quick, easy work of it! Remember, with power tools especially, it pays to get the right start with the best tools in the first place! For fencing, grain bins, milk houses, poultry brooders, hog houses, manure pits, tool sheds . . . on down the long line of farm jobs with wood . . . BLUE STAR Power Tools stand up and deliver anytime . . . because they're the best tools for your needs, in the first place!

9" Tilting Arbor TABLE SAW
Only **$95.50**



For long hours . . . steady cutting . . . ripping fence boards, siding, lining, or for cross-cutting boards, rafters, posts and planks, the BLUE STAR circular saw is built to give . . . and to take it! Large 20½" x 27" table . . . "shift blade" mitre gauge . . . unique trundle floor stand . . . plus its ability to mount a heavy duty motor, make it the ideal power cutting farm tool. A tool of lifetime accuracy, built by master craftsmen, backed by 28 years of "know-how".

Power DRILL PRESS
Only **$48.70**

A must for attaching almost anything with bolts or pins . . . drills and taps wood and metal . . . stands the grind. Does easy, accurate drilling through heavy metal bumper and kick plates, metal wagon wheel rims, re-tapping hinges; boring for rafter, door, gate, bolts and clamps. With attachments, the BLUE STAR Drill Press will sand, mortise, buff, polish, even shape for you on all types of materials.

ASK ABOUT OUR FREE TRIAL OFFER!

Get complete information on the BLUE STAR full line of Wonder Woodworking Power Tools for the farm . . . the tools that start you right in the first place!

BLUE STAR PRODUCTS

652 KIRKWOOD ST. FAIRFIELD, IOWA

THE RELUCTANT MULE (Continued from page 33)

the large colt crops from 1938 on, the yearly mule census has not shown an overall increase since 1925. And although food production quotas were high and mechanized equipment was scarce during the war years, the mule crop contracted in 1942 and has continued to decline ever since. The estimated number of young mules on farms in 1947 was lower than it had been for any year of this century.

Old mules are dying faster than the young ones are growing up. About fifteen years ago it was estimated that the average age of mules was eleven years. Today, the average age is higher. Since the life of a mule ranges between 17 and 19 years, the present-day average age figure is of some significance. It indicates that the mule is already past his prime and is rapidly passing into the ranks of those other symbolic animals of early America—the Texas Longhorn, the American Bald Eagle, and the American Buffalo.

Another development can be foreseen in the immediate future. At present, the big mule states are all below the Mason-Dixon Line. Here mules and horses are not only more numerous, but are also used more hours per day and more days per year than they are in any other section of the country. In 1942, the average workday for horses and mules in the Delta states was 9.6 hours compared with 8.5 hours in the Corn Belt states. Forty acres and a mule are still common in the South; 200 acres and a tractor is the Midwest story. The land of cotton is the mule's last stand.

The decline of the mule was reflected in the number purchased by the United States Army during World War I and World War II. The United States was in World War I for approximately a year and a half. In that short time the army purchased 123,660 mules. But throughout the entire duration of World War II only 29,336 mules were acquired, and those for use in the Pacific and Mediterranean theaters.

The mule had a brief day after World War II. With one foot in heaven, he still packed a tremendous wallop in the other. When the war ended, the Missouri mule was called upon to help with the biggest repair job in recorded history. The United Nations Relief and Rehabilitation Administration purchased 20,500 mules in the United States to be used for general farm work abroad. Of that amount the origin of 15,000 purchased through the Department of Agriculture can be traced. Of these, 5,400 were purchased in Missouri. In addition to the number shipped from this country to needy areas, the UNRRA turned over a considerable number of army mules, veterans of vigorous service in the Pacific, to Chinese farmers and cart drivers. According to dispatches from Shanghai at the time, each of these erstwhile army mules was given, before his naturalization, a thorough course in Chinese language training, "sufficient to condition him to obey the hissing commands of Chinese masters."

The St. Louis Post-Dispatch, in commenting on the incident, pointed out that nothing but disaster could be in store for the unfortunate Chinese mule driver. Not only was he inexperienced in handling such creatures as American mules, but should he chance upon a *Missouri* mule, his prayers would avail him little. An animal whose soul had been tempered by the lusty curses of Missouri farmers and who had felt the iron hand and heard the unenlightened profanity of the G. I. mule skinner would probably only lay back his ears and dig his hoofs a little deeper into the earth in response to the singsong pleading of a Chinese cartman. What mule would heed "You vile descendant of evil and malformed Missouri abominations, will you not be pleased to pull my plow!"

When the hoof and mouth disease struck in Mexico in 1947, it was the Missouri mule which was sent to the rescue. There was a desperate need for heavy work-stock to replace the draft cattle killed in controlling the spread of the disease. The mule is strongly immune to the plague.

The Mexican sales were the last big mule sales. Since then the market has deteriorated. Tony Paiton, who has worked around mule auctions for 41 years, claims that more mules formerly went past the auctioneer in Kansas City in an hour than now go by in a month.

While watching the mule auction recently, a mule trader pointed out a big, fat mule selling for $40 and said, "I've seen the time when a mule like that would bring $600." At the same sale one of the few farmers who did buy a team of mules remarked that he used tractors to do most of his farm chores, and bought the mule team to "play with." Indicative of the trend of the times, Fred Owen, one of the biggest mulemen of them all, recently acquired his own rendering plant.

On the occasion of President Truman's inauguration, four sorrel mules, as emblematic as anything can be of the sovereign State of Missouri, were brought from the President's birthplace, Lamar, Missouri, and given a place of distinction in the inaugural parade. The Missouri mules, the only four of their kind in the country with white tails and white manes, somehow sensed the honor which was bestowed upon them. They behaved in a very un-mule like manner, almost like gentlemen, and walked quietly amid the tumult and shouting about them. In April, 1911, Champ Clark of Missouri was elected Speaker of the House of Representatives. A similar parade was staged in his honor. On that occasion, however, Champ actually rode down Pennsylvania Avenue in a carriage drawn by two Missouri mules, "Belle of Pike" and "Belle of Callaway."

21 Smart ideas* for 1950!

(L to R) Ford 145-h.p. Model F-7, Model F-5 and Model F-1 passing tough tests at the Ford test track.

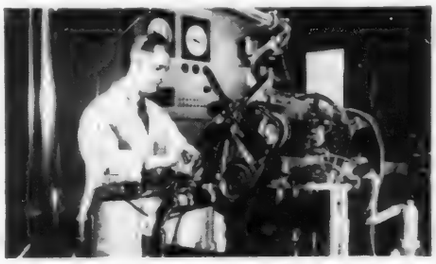
America's No. 1 Truck Value!

Only Ford gives you a choice of V-8 or Six in a full line of over 175 truck models!

Ford Trucks for 1950 give you new models, new power, new Bonus Built features . . . 21 smart ideas in all. *New models* like the F-3 Parcel Delivery. *New power* like that of the new 110-h.p. Six. *New features* like air brakes available on Model F-8. You'll find all these smart ideas in America's No. 1 Truck Value for 1950, plus Bonus Built construction which means big reserves of strength and power. See your Ford Dealer today!

21 Smart ideas ✱ New 110-h.p. 6-cylinder engine ✱ New Parcel Delivery models ✱ New air brakes available on the F-8 ✱ New wheelbases: 176-in. for F-5 and F-6; 147-in. and 178-in. on Big Jobs ✱ New 15-in. by 5-in. rear brakes for the F-7 ✱ New 4-speed Synchro-Silent transmission with 110-h.p. engine ✱ New single-speed rear axle for F-8 ✱ New, extra-heavy duty clutch with 110-h.p. Six ✱ Million Dollar Cab ✱ Level Action cab mounting ✱ Air Wing door glass ventilators ✱ New Double Channel frame for Big Jobs ✱ Gyro-Grip Clutches ✱ New single-speed axle for F-6 ✱ Roll Action Steering ✱ New, extra-heavy drive line with 110-h.p. Six ✱ Quadrax rear axles ✱ 4 engines—choice of V-8 or Six ✱ New heavy duty 3-speed Synchro-Silent transmission available for F-1, F-2, F-3 ✱ Choice of over 175 models ✱ Bonus Built construction, which means big reserves of strength and power.

NEW PARCEL DELIVERY chassis comes with grille, windshield and front quarter-windows. Available in Series F-3 and F-5 (Special order).



NEW 110-H.P. SIX available on Series F-6 has Free-Turn exhaust valves, Autothermic pistons, chrome-plated top piston ring.

Ford Trucks Cost Less Because—

FORD TRUCKS LAST LONGER

Using latest registration data on 6,106,000 trucks, life insurance experts prove Ford Trucks last longer.

Well Bred from Well Breeders"
. . . for Over 35 years . . .

HALL BROTHERS Chicks

More than 10,000 poultrymen every year rely on dependable Hall Brothers Chicks for extra, surer, meat and egg profits. Famous for 35 years for QUALITY and for PROFIT-BREED-ing, Hall Brothers' Chicks year after year ring up new profit records for Hall Brothers' customers.

Send today for Hall Brothers' catalog and start down the road to higher profits . . . with proven TOP QUALITY Hall Brothers' Chicks.

HALL BROTHERS HATCHERY, INC.
Box 10 Wallingford, Conn.

FARMERS SING A SONG OF PROFITS WHEN THEY FEED THAT GRAIN-STRETCHING BLUE RIBBON CONDENSED BUTTERMILK TO THEIR PIGS AND POULTRY

BLUE RIBBON Special
FORTIFIED CONDENSED BUTTERMILK

WRITE US FOR PRICES
PLANTS THROUGHOUT THE CENTRAL WEST STATES

THE MERCHANTS CREAMERY CO.
536 Livingston St. Cincinnati 14, Ohio

The Family Tree

It is said that a mule has no pride of ancestry and no hope of posterity. He is a hybrid, a cross between a horse and an ass, and is almost always sterile.

The horse is *Equus caballus* while the ass, donkey, and burro are *Equus asinus*. Male donkeys are called jacks and female donkeys are called jennets. The cross between the jack and horse mare produces the mule, while mating a stallion and jennet produces a hinny. The standard crossing is, of course, with the jack and mare; the hinny is not deliberately bred in this country, since the mule is the more valuable animal of the two. The mule has more size, style, finish, bone, strength, and all the qualities which make this type of animal useful. The hinny partakes more of the nature of the horse in form and disposition than the jennet. It has a neater head, heavier head and mane, and a larger foot than the mule. However, authorities seem to agree that the hinny does not have the strength or the endurance of the mule. The hinny has a whinny similar to a horse's; a mule brays like a jack. Both the mule and the hinny can be of either sex.

It is commonly believed that the mule, being a hybrid, is sterile. However, there is a division of opinion, with most of the weight of evidence on the other side. A number of cases of female mules that produced progeny are on record, well authenticated. In one instance, checked by the Texas Experiment Station, a female mule produced to the cover of a stallion, and later produced to the cover of a jack. One of the colts was therefore ¾ ass and ¼ horse and the other ¾ horse and ¼ ass. A St. Martinsville, La., mule mare by the name Lou dropped a colt on Nov. 13, 1947. This was verified by a veterinarian.

Female mules will accept service from a jack, a horse, or a male mule quite readily at certain times, but of the millions that have been so bred, only two or three records of conceptions are on record. There is no evidence of get sired by a male mule.

Numerous tests have been made in comparing horses and mules in pulling contests. Under pressure with whips, it seems likely that mules will pull as much in proportion to their weight as horses; but where whips or goads are not allowed, horses pull more. In other words, mules always work with some mental reservation.

On one side of the mule is the horse, on the other side a donkey or an ass. Thus mules may be any color or variation of colors, depending on the color of the dam or sire. There are white mules, sorrel mules, dapple gray mules, and just plain mules. In these latter days, since the mule has left the furrow to become the breeder's hobby, the show ring brings out some striking animals. Sorrel mules, albino mules, palomino mules, and bay mules with while tails and manes are darlings of the mule fanciers.

More — much more — by the Spurway Method

NO_3 P K pH Mg Fe Al

Simplex SOIL TESTING

ACCURATE • EASY • INEXPENSIVE

The Complete Simplex Soil Test Outfit: All the reagents and apparatus necessary for 100 to 300 tests for each of 15 important soil chemicals plus 4 reserve tests and tissue tests. F.O.B. Cleveland $36.

THE EDWARDS LABORATORY
P.O. Box 2742-D CLEVELAND 11, OHIO

Ca NH_4 NO_2 SO_4 Cl Mn

OTTAWA POST HOLE DIGGERS

Prices from $99.50 up

Patents Pending

Here are the tractor diggers you have been waiting for. Quickly hitched to most any farm tractor with power take-off. Fastest power auger return — pull cord control. Heavy hi-speed two-flight auger—leaves hole clean. Castor wheels permit fast and accurate settings. Safety clutch prevents damage, eliminating shear pins. Strictly a one-man digger. All controls from driver's seat. Short-cut to labor problems where holes are needed. Get up-to-the minute facts by sending for descriptive matter and low factory-to-user prices.

New Low Prices

Serving farmers for 44 years.

OTTAWA MFG. CO., 6-089 Elm St., Ottawa, Kan.

MAKE MONEY! RAISE CHIN-CHINS

PURE-BRED CHINCHILLA RABBITS

VALUABLE BREEDERS—PEDIGREED!
PROFITABLE! EASY! PLEASANT!
NO EXPERIENCE REQUIRED
WE SUPPLY ALL INSTRUCTIONS FREE!
REAL PROFITS! From Delicious Meat, Beautiful Furs, Laboratories, etc.
PROVIDE PERMANENT SECURITY
FREE ILLUSTRATED BOOKLET—WRITE TODAY!
ROCK HILL RANCH, SELLERSVILLE R-3, PENNA.
World's Largest Breeder of Chinchilla Rabbits

The Work Ratio

The truth of the expression "A mule will do the work of six horses" is borne out when it comes to endurance under adverse conditions, especially in hot weather. No draft animal, so far developed, has the endurance of the mule under all kinds of working conditions.

Missouri farmers believe that a team of mules can outwork two teams of horses on a hot day. This is one reason why the mule has been used extensively for over a century on the cotton farms of the South. It seems that a mule's hide is tougher, harder, and less sensitive, making the mule more capable of resisting sun and rain.

It is the general opinion among farmers that the mule requires less food for the performance of an equivalent amount of work. A writer in the American Farmer (about 1828) stated that each mule saved the farmers of Maryland $13.38 a year in feed costs. However, the Ohio Experiment Station, after a series of tests, concluded that mules doing the same work eat just as much in proportion to their weight as horses.

A mule will, nevertheless, eat almost anything rather than starve. He will not only eat a coarser food but will thrive under conditions which would kill a horse. A mule will find enough to eat where any other animal, save a goat, would starve to death. Straw, pine boards, the bark of trees, grain sacks, pieces of old leather, and old felt hats go down the hatch when the mule is hungry. Out of the Civil War comes a story of a team of mules that ate a government wagon. On the other hand, a mule can go for long intervals without food.

Mule vs. Horse

Many a blow has been struck behind the sales barns on a Saturday afternoon of by-gone days by men who sought to settle the old question of which is the superior animal, the mule or the horse. Farmers who have used both, sober, calm men who are not partial, say that mules are less likely to overeat or overdrink than horses, especially when they are tired or overheated. A mule will not injure himself in a runaway or by charging into a fence. A horse will knock himself out, but a mule never. He has too much common sense for that and doesn't get excited. Mule colts are easier to raise than horse colts for that reason. Since mules do not reproduce, farmers rarely own all mules. If they prefer mules, they still have to keep a good brood mare or two to supply mule colts.

It is true that mules sometimes balk under heavy loads. Tradition says it is because they are stubborn and perverse; those who know the mule say he's too smart to do more than he has to. In fact, there is much evidence to support the claim that a mule is smarter than a horse. Even his detractors notice that he rarely gets himself into a jam, and always has a sharp eye open for his best interests, not always true of a horse.

Mules can withstand heat and rain better than horses. They are less impatient under heavy loads and get along better with poor care.

The mule also outlives a horse. The Horse and Mule Association of America made a study a number of years ago in which they concluded that the average life of a work horse was 15 years; of mules, 18 years. Mansfield Torrance in the American Farmer, September 1, 1826, claims that he heard of some mules being worked 50 years and that he knew of mules in service that were over 40 years of age. Howard Bailey, a famous Missouri mule dealer, once bought a team of mules for $250 which were 32 years of age.

The mule costs less to shoe and is more sure footed than a horse. He will hold a shoe longer than a horse because his hoof is more deeply cupped and is tougher. The mule suffers less from disease than does the horse.

The horse has a number of advantages over the mule. He comes to maturity more quickly. Horses can be put to hard labor sooner than mules. Larger and stronger horses can probably pull heavier loads. Rarely do you hear of a mule weighing over 2000 pounds; many draft horses weigh up to 2600 pounds. Horses are easier to handle, less temperamental, less likely to kick. The average farm horse can be used for both riding and plowing. The horse owner looks down on the mule man, so the horse probably has an aesthetic value which the mule would not aspire to.

The mule requires more patience than a horse and when the ordinary farmer's patience wears thin he resorts to the natural thing,—he cusses and lays on the cudgel.

The horse's call, or song, or cry, is sweeter by far than that of a mule's. And last, the horse, to most people, is prettier than a mule.

The common belief that a mule will not work unless stimulated by a knout and strong language, is, according to some mule skinners, all poppycock. He will work, they say, but slow and reluctantly. We Americans are an impatient people, and the mule is not geared to American tempo, so we cuss him and beat him.

There is also a belief, somewhat better founded, that a mule driver is born and

GOOD EARTH

CAN ONLY BE GOOD

When it contains the proper minerals—soil can't produce properly if mineral starvation is at work—minerals are as essential to healthy, productive soil as they are to the human body—ES-MIN-EL contains the essential mineral elements of Boron, Manganese, Zinc, Iron, Copper and Magnesium—Higher production, healthier produce rich in vitamin content come from properly mineralized soil.

Send postal card or letter for booklet on ES-MIN-EL to Tennessee Corp., Grant Bldg., Atlanta, Ga., or Lockland, Ohio.

ES-MIN-EL

SOIL APPLICATION

IF your soil was not properly mineralized before planting you can now get the new ES-MIN-EL for use in dusting or spraying—you can now feed your growing plants these essential mineral elements through the leaves and stems by applying an application of the new form of ES-MIN-EL used for spraying and dusting only.

ES-MIN-EL Essential MINeral ELements SPRAY OR DUST

DEMAND—that your local fertilizer dealer furnish you a mineralized fertilizer containing the essential mineral elements. For information on mineralized fertilizer write: Tennessee Corporation, Atlanta, Georgia.

TENNESSEE CORPORATION

Atlanta, Georgia — Lockland, Ohio

RAIN
YOU CAN COUNT ON!

BUCKNER
CROP INSURANCE

Take uncertainty OUT of your farming with Buckner's *Perfect Curtain of Water.* When and where you need it! So surely and inexpensively.

Sandproof bearings, perfect balance, patented dual-action, engineered for fine spray or large volume. For both portable and permanent irrigation systems. Let Buckner Sprinklers show you new crop profits now.

FREE CATALOG
on NEW MODELS

Write HERB CLARK Today
P.O. Box 232
Fresno, California

PERFECT WATER CURTAIN SPRINKLERS
BUCKNER MANUFACTURING CO.

PRICES ARE DOWN!

FREE send for your copy TODAY
Big . . . New . . .
1950 CATALOG

Lower prices keynote our latest farm and poultry catalog. You'll find hundreds of real, old-time values in this year's wider merchandise selection.

Note particularly the favorable prices on farm fence, barbed wire, welded wire and netting. As the largest distributors of wire in the Midwest, our volume buying enables us to pass on savings directly to you.

Bussey customers — thousands of them — buy with confidence because everything we sell is unconditionally guaranteed to satisfy. Here, under one cover, is everything for the modern poultryman. Make buying at Bussey's a habit.

BUY DIRECT and SAVE!
BUSSEY PRODUCTS CO.
6000-9 W. 51st St. Chicago 38, Ill.

not made, and that preferably he should be born in Missouri. Ora Oats, a Missourian who has worked mules for fifty years and is now driving a team in an Oklahoma oil field, was asked the secret of handling the animals. "When you first get a mule," he said, "you beat hell out of him until he gets afraid of you. Then you treat him nice and make friends with him and he'll do anything for you."

"You musn't think hard of a mule if he kicks you," he added. "It's his way of showing that he likes you."

Bargain Prices Now

In their heyday any good mule team sold for $500. During World War 1, W. P. Dysart of Columbia., sold an iron grey mare mule for $700. About the same time Owen Woodson sold a team of four-year-olds to Boone County Mill for $800. Two years later the Mill turned around and sold the same team for $1300.

Today a pair of mules will sell for whatever a man is willing to pay: $150 for a team of very good work mules would be a good price. The average price at the auction in Kansas City is between $30 and $60, although most of these are has-beens which go to the rendering plant, or else they are not broken. The Department of Agriculture estimates that the value of usable mules per head on January 1 of this year was $117, or $16 less than the previous year.

Since mules are sterile no registry is kept. There is no such thing as a thoroughbred mule, but the quality of the mule is closely related to the character of the mare and the blood of the jack. Blooded jacks and jennets, on the other hand, are registered. On November 22-23, 1888, the American Breeders Association of Jacks and Jennets was organized. Charles E. Leonard of Missouri was elected as the first president. Fourteen stud books were published containing a total of more than 6000 jacks and 5000 jennets. In 1913 the Standard Jack and Jennet Registry was organized in Kansas City, Missouri. In March, 1923, the two organizations merged into one under the title, Standard Jack and Jennet Registry of America. Five volumes of records containing over 20,000 entries have been published.

Rest In Peace

The mule is vanishing, but like the British Tommy, he will not die, but only pass away. They say no one ever saw a dead mule, and few can deny this. When their useful days are over they are not pensioned to green pastures and cool shade like the beloved Dobbin of the family, but are sent without shift to the glue factory or the dog meat butcher. It couldn't happen to a better guy.

THE AUTHOR—J. A. Burkhart was teaching a course in American Civilization in a Missouri college when he became interested in what that civilization had done to the mule. The area around Lathrop, Missouri, once had more mules per acre than any other area in the world. "Today," Burkhart reports, "on the same land, a mule is almost a rarity." During the next several years, Burkhart traced the demise of the mule. He talked with most of the famous mule raisers and traders in that mule famous country, and this *Farm Quarterly* article was the natural outcome of his extensive research.

RYE (Continued from page 39)

Rye is widely planted as a green manure for poor soils. While it will do comparatively well on poor soils, it gives the best yields on fertile land.

Rye has never been a favorite subject for research among plant breeders. With a couple of exceptions they have decided that rye is rye the world over and have made little effort to look for a better model of the rye which farmers have been planting for centuries. Most rye is still known only as common rye. The two primary exceptions to this rule are Balbo Rye and Rosen.

Balbo is rapidly gaining favor for its ability to produce good winter cover, late fall and early spring pasture, and green manure. Balbo got its start in this country in the early twenties when the Tennessee Agriculture Experiment Station received a small sample of rye seed from Italy. The seed was planted in a test plot and the grain harvested. During the following years this procedure was repeated until eventually the Experiment Station had enough of the new rye to introduce it to farmers. This variety of rye, named in honor of an Italian aviator, proved exceptionally good for pasture. In one test Tennessee scientists found that it produced 40 per cent more pasture by the first of January than common rye did. Its fame spread and today Balbo has become a favorite variety both in and out of Tennessee.

Balbo's biggest selling point as a pasture possibility is its rapid upright growth. Common rye spreads out and hugs the ground while it is young, which makes it difficult for stock to graze. When plowing time comes the following spring, however, there is little difference between them. Balbo, in addition to its other good points, gives a higher grain yield than common rye.

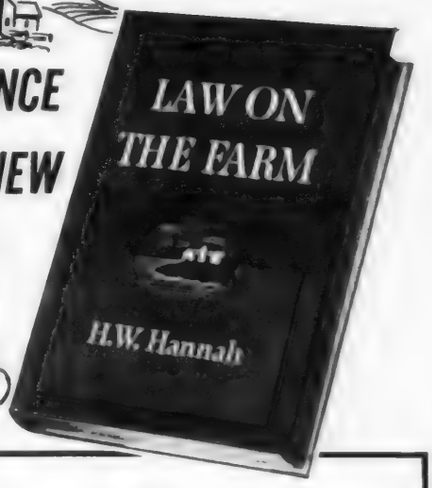
Rosen is a variety developed in Michigan, primarily for high yield of grain. Its popularity is growing among farmers in Michigan and surrounding states.

Rye can be plowed under any time in the spring when plowing is convenient, and regardless of the stage of its growth it will add organic matter to the soil. Authorities agree that the best time for the job is when the rye is knee high. The rye is still young and tender and contains more nitrogen than at later stages which in turn helps it to decay faster. Rye left standing until it is tall and coarse is sometimes plowed under with an application of some high nitrogen content fertilizer to speed up the decomposition and to prevent an initial drain on soil nitrogen.

Where rye is plowed down to make the field ready for corn or beans the plowing should be done a couple of weeks before

GIVEN... THIS INDISPENSABLE REFERENCE VOLUME WITH CHARTER MEMBERSHIP IN THE NEW

FARMER'S BOOK CLUB



NO FARM can afford to be without the insurance against worry, loss and costly mistakes which this book provides. H. W. Hannah, the author, is a well-known authority on farm law, and his book, the first of its kind, tells in simple, easily understood language what your legal rights are in hundreds of common farm problems. Whenever you have questions on the purchase of land, water rights, trespass, contracts, taxation, tenancy, depredation by neighbors' animals, expropriation of your land by the state, and others, you can turn to this book for the complete, up-to-date answer. The publisher's price of LAW ON THE FARM is $4.50. You may have it *absolutely free* if you decide to join the FARMER'S BOOK CLUB now.

A SPECIAL BOOK-CLUB SERVICE FOR EVERY FRIEND OF THE LAND

Now for the first time you may receive, through membership in the FARMER'S BOOK CLUB, your choice of the best books on every important phase of farming and farm life . . . *and at substantial savings!*

This opportunity is made possible because thousands of intelligent, progressive farmers have discovered that books are as important on the farm today as the latest farm implements. They have discovered that the dramatic achievements of modern agricultural research, reports of valuable experiments going on all over the world, and the pioneer work of experts on farm problems find their best and most readily useful expression in books. Selecting the most valuable of these books and bringing them to the attention of busy farm families is the practical purpose of the FARMER'S BOOK CLUB. And through the club, farmers are now able to buy such books at a real saving.

How Membership Will Benefit You—None of the books offered to members of the FARMER'S BOOK CLUB will contain information they could get just as well from government bulletins and farm journals. They will be selected from the new books of *all* publishers for their pertinence, general interest and authority . . . books which blaze new trails to easier, better ways of increasing farm income, to making country living as rich and satisfying in social and economic advantages as any other way of life . . . practical, readable, attractively presented, down-to-earth books that will benefit you, your family and farm associates far beyond their small cost. In general, we plan to select books which have actual value of a practical nature.

How the Club Operates—It costs you nothing to begin enjoying membership in the FARMER'S BOOK CLUB. You simply fill out and send in the enrollment coupon below. By return mail you receive, as a gift, a copy of *Law on the Farm*. Six selections, one every *other* month instead of the usual one *every* month, will be offered to you each year, thus doubling your assurance of receiving only the best books available. You have your choice of four of these—*at less than publishers' prices*—and may reject any selection *before* or *after* receiving it. At regular intervals you will receive the club's bulletin, "Books on the Farm," giving you advance reviews of the forthcoming selection and containing news of other important, but more specialized, farm books on everything from breeding Angus cattle to raising zinnias. For every four selections you buy, you will receive a *free bonus book* which, together with the selections, will make up one of the most valuable farm libraries it is possible to assemble.

Accept a Trial Membership NOW—Why not decide now to become a member of the FARMER'S BOOK CLUB. You have nothing to lose and everything to gain. Here is the one book club designed to serve your general and special farm interests . . . one from which you can be assured of getting real satisfaction and practical help. Fill out and mail the enrollment coupon today.

OUTSTANDING BOOK IS FIRST SELECTION

TREE CROPS by J. Russel Smith has been chosen as the first selection of the FARMER'S BOOK CLUB. It is one of the finest farm books we have ever seen. Sound, interesting, and beautifully illustrated, it tells how to use non-productive land for a variety of tree crops—for fodder, fertilizer, and for cash. The publisher's price will be $5.00. Members will receive it on publication for $4.50. This is typical of the quality and value of forthcoming selections which will deal with such subjects as rotation, soil conservation, crop and livestock raising, human nutrition, as well as others keyed to the social and recreational side of farm living.

MAIL THIS COUPON TODAY!

THE FARMER'S BOOK CLUB
A Division of THE DEVIN-ADAIR COMPANY, Publishers
23-25 East 26th Street, New York 10 FQS

Please send me a free copy of LAW ON THE FARM and enroll me as a charter member of the FARMER'S BOOK CLUB beginning with the first selection TREE CROPS. I will receive the club's bulletin "Books on the Farm" giving advance reviews of selections which I may reject before or after receipt. I agree to accept four of the six selections a year and may terminate membership any time thereafter.

NAME.....
(PLEASE PRINT)

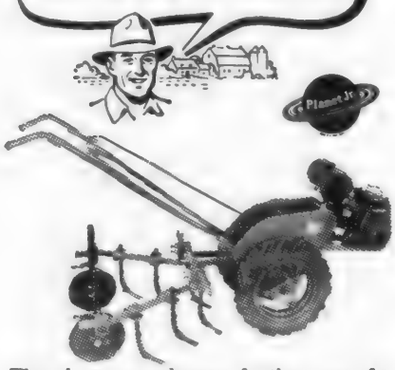
ADDRESS.....

CITY.....ZONE.....STATE.....

My special farm interests are.....

.....

I Have a
Planet Jr.
Tractor
And It's The Best!



There is every good reason for the owner of a Planet Jr. Garden Tractor to say just that.

In the design and construction of Planet Jr. there is 80 years of manufacturing knowledge. That means much more than merely the assembly of a machine. You want a Tractor that will plow, disc, seed, cultivate, fertilize, mow, push snow, and do grading and hauling. Most important, you want these jobs well done, and you want assurance of a long period of useful operation.

The Planet Jr. line includes Tractors, Seeders, Fertilizer Distributors, Cultivators and a wide variety of "Planetized" Tillage Steels. See your dealer now to arrange delivery.

S. L. ALLEN & CO., Inc.
3459 North Fifth Street Philadelphia 40, Pa.

planting time so that decomposition will be under way by planting time. Where it is planted in orchards between the rows of fruit it is usually disced down in the spring, preferably at the boot stage. Unless plowed down a few weeks before planting, the following crop may be set back because the rye may form a dry layer between the plowed and unplowed soil.

Rye can serve as a nurse crop for legumes but it is not as good for the job as oats, wheat, or barley. Rye has a tendency to crowd legumes by the time they come up in early spring.

The best procedure when planting rye with another crop is to cut down the seeding of rye to make room for the legume. Whether it is grown for pasture, green manure, or winter cover, it is often planted in combination with a legume. Either hairy vetch or winter vetch is a good crop to do team work with rye. The seed mixture should include one bushel of rye and 20 pounds of vetch seed, both seeded at the same time.

Rye which is planted for pasture also serves as a green manure crop when plowed under in time to make way for the coming crop. Milk cows are often pastured on young rye, but there is always the possibility that the rye will taint the milk. To avoid this costly possibility farmers have learned to take the cows off the rye at least three hours before each milking.

Rye is occasionally made into hay for winter feeding, but this is a rare practice since the same field can usually be planted to some other crop which will make a much better quality of hay. Rye used for hay is cut in the blossom stage, since if left to ripen it becomes coarse and straw like.

Should You Feed Rye

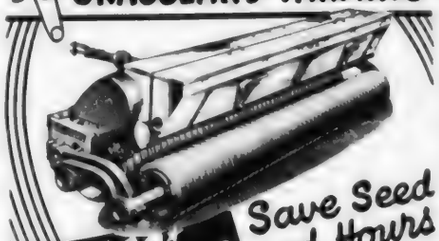
Rye grain is a good livestock feed. Even clean rye, however, seems to be less palatable to stock than does wheat. When it is fed as the major source of protein in a feed, or stock is fed too heavily on it, they may suffer digestive disturbances. Rye proves satisfactory for cattle, but the best results from feeding the grain have been obtained with feeding lambs. Hogs vary in their reaction to rye grain and there are no well founded rules for feeding rye to swine. In any case, rye with ergot disease may poison stock.

Farmers who grow rye for the cash grain market have a by-product in the straw. They prefer to thrash the grain in a separator rather than a combine, to keep the straw long and unbroken. Rye straw has a variety of uses and usually brings good prices on Eastern markets. Manufacturers turn it into mats, bottle protectors, wrapping for nursery stock and stuffing for horse collars.

Diseases

The only common disease of rye is ergot, a fungus growth. Rye infested with ergot has dark, finger-like growths replacing the

HERE'S THE ANSWER TO SUCCESSFUL GRASSLAND FARMING



Brillion SURE-STAND GRASS SEEDING PULVERIZER AND PACKER

Save Seed and Hours of Labor

DO FOUR THINGS AT ONCE-

Seeds Legume and Brome
★
Pulverizes the Soil
★
Packs the Soil
★
Produces a good catch

You actually can save 5 to 13 lbs. of seed per acre, as thousands of farmers have done in all parts of the country . . . and save hours of hard work, too (once over the field and you have a mulched seed bed without lumps or hard clods). While doing this you get a good catch—a "sure stand" . . . all these savings soon add up to paying its initial cost . . . and go on saving you money for many seasons, because Brillion SURE-STAND is made to last . . . to "take" today's high tractor speeds. There are 6 models to select from—made in 5' 4", 8' 3" and 10' 8" rolling widths.

Write today for the complete story. We'll gladly send you FREE illustrated folder F-1 showing Brillion SURE-STAND in actual colors, and name of your nearest dealer where you can see the model best suited to your needs.

BRILLION IRON WORKS, INC.
BRILLION, WIS.

WHITE AFRICAN GUINEAS

Big Profits
Easily Raised
Rapid Growth

WHITE CHINESE GEESE — Small Compact Broad-Breasted Birds, Great Money Makers HATCHING EGGS BABY GOSLINGS & GUINEAS. Catalog Free. Guinea Book 50c.

GOSHEN POULTRY FARM
Dept. G-20, Goshen, Indiana

Vapor Outlet
Motor Oil Changes
ENTIRELY UNNECESSARY
after attaching
RECLAIMO
(Cast Aluminum)
The World Famous HEATED Oil-Filter and Re-Refiner!!
Makes short work of solids and liquid impurities—after 150 miles you won't believe it's the same oil! REMEMBER—"Oil does not wear out mechanically", states U. S. Bureau of Standards.
Convince yourself—just read our "Oil Facts", 32 pages, FREE on request.
RECLAIMO MFG. CO.
5083 Elston Ave., Dept. 24, Chicago 30, Ill.
Dealers Wanted
Oil Return (to crankcase)
Heat Inlet (from manifold)
Heat Outlet
Oil Inlet

kernels. These are forebodings of danger, for rye with ergot is poison to man and beast. Although it does not commonly cause death, it can cause abortion in pregnant animals.

The scientists who are taking time to point out the advantage of growing rye where it has proved its value, also add that rye has its drawbacks. If allowed to grow too tall before being plowed under, it decomposes slowly because there is too little nitrogen present to speed up decomposition. The nitrogen which is essential in decomposition is drawn from that already in the soil and this can cut down yields of following crops. Both the growing crop and the bacteria decomposing the organic material in the soil need nitrogen to exist and where they are competing for the element, the nitrogen goes to the bacteria. The best way around this difficulty is to seed a legume with the rye. Some farmers, however, prefer to spread barnyard manure or high nitrogen content commercial fertilizers on the field before plowing. Three to five tons of manure to the acre, or enough nitrogen to furnish the amount of nitrogen supplied by 100 pounds of amonium nitrate, will speed up decomposition and aid the rye in enriching the soil. In any case, the younger the rye when turned under, the faster it decomposes.

The raw material from which humus is made is green plant growth, and rye promises to hold its important place as a supplier of this growth, for rye, in bottle and basket, has stood the test of time.

HOW TO BENEFIT FROM PRICE SUPPORTS

(Continued from page 27)

grade or better, or No. 4 by weight only. If it is better than No. 3 he will receive the current premium; if No. 4 it will be discounted. When he makes the delivery he is paid for the grain.

"With these two methods of securing price support open to all of the farmers in the county, I still see trucks lined up in front of the elevator every day selling their corn for 93 cents a bushel when they could be getting $1.42 this year." Demaree said in a puzzled voice. "I've talked to a few of the farmers to try and find out why they are willing to give up a chance to make an extra 48 cents a bushel. The usual answer is that they don't want to be bothered with all the red tape. Some say that they don't think their cribs would pass inspection. These are the fellows who have a sandpaper and paint idea about corn cribs. I happen to know that some of them have good, solid cribs that would be perfectly safe for storing corn and would certainly pass our inspection. I think the real reason is that they just haven't looked into the possibilities."

Wheat

For the coming year the Government has

HOW TO MAKE MORE MONEY WITH YOUR GRAIN!

Get your money back on grain storage with----

BS&B "PERFECTION" Steel GRAIN BINS

You profit two ways on grain storage with BS&B "Perfection" bins. First, you get 100% grain protection keeping your grain in top shape for full market value. Second, government fees soon pay for bin . . . *you actually get your investment back and more.*

The BS&B bin is built for fast, easy assembly. Precision built, perfectly sized parts slip together assuring a weatherproof, verminproof, fireproof bin. No special tools or skill required. No bending or cutting needed.

Guaranteed "Perfection" bins are built to last for years. The corrugated, galvanized shell with heavy bolts gives the strength needed to carry designated capacity plus adequate safety margin. Can be used to store wheat, shelled corn, beans, rice, cowpeas, and maize, and other grains. Available in 1000, 1300, 2200, and 2750 bushel sizes.

APPROVED and ACCEPTED by U. S. GOVERNMENT for LOAN

Built far beyond minimum specifications for loans and insurance as set forth by the Department of Agriculture and Department of Commerce. Storage fees paid to farmer should pay for bin in 3 years or less. See your local Production and Marketing Administration office.

Only BS&B offers these outstanding features

- New canopy roof turns down to prevent rain and snow from blowing in between roof and shell. Part of one roof section removable for easy filling.
- Ventilator base fits down tight over corrugated roof sections. Keeps out rain, snow and birds. Ventilator cap removes to make 21" opening for center filling.
- Door frame is one-piece . . . welded at factory for easy assembly. Edges of frame are corrugated to match shell. Door is double thickness, 22 gauge steel, full 3 feet wide.

FREE

"FARM FACTS HANDBOOK"

This booklet is a ready reference for busy farmers. Filled with helpful information and practical advice to help answer problems arising daily.

____ Calculations
____ Crops
____ Livestock
____ Poultry
____ General

Saves you time and trouble. Get your copy today.

JUST MAIL THIS COUPON NOW

ACT NOW! Prepare to put your grain to work making money

Grain storage isn't an expense . . . it's a profitable investment. You get your principal back plus a bonus. If you will send us an estimate of your expected grain storage space requirements, we will send you a free copy of Farm Facts Handbook (see left).

BLACK, SIVALLS & BRYSON, Inc.
Power and Light Bldg. Kansas City, Mo.

Special Products Division, Section GB-64
BLACK, SIVALLS & BRYSON, INC.
Power and Light Bldg., Kansas City, Mo.

I want to qualify to get your Farm Facts Handbook. I will need storage space for approximately _____ bushels of grain.

NAME_____

ADDRESS_____

CITY_____ STATE_____

FOR ALL SIZE OPERATIONS and ALL CROPS —
ARIENS Tillage Equipment
TILLIVATOR

Models TO MEET YOUR NEEDS

NOW AVAILABLE FOR WHEEL TRACTORS

The modern way to solve cultivating problems

The TILLIVATOR is the cheapest known mechanized method for row crop cultivation. In ONE operation it completely destroys weeds, eliminating hand weeding and labor. Any combination of row widths can be cultivated accurately . . . it is easy to handle . . . adjustable to row spacing and row widths, with simple adjustment for uniform depth. Cultivating may be done close to the row.

Ask for details on ARIENS tillage equipment. ARIENS-tiller, the lowest price per HP of all rotary tillers, and the new Gardeneer.

ARIENS COMPANY BRILLION WISCONSIN

Look for this name... BOYT

it's a mark of distinction on:

RIDING EQUIPMENT

Riding equipment for farm use, pleasure and show. English and Western saddles, bits, bridles, spurs. Stable blankets. Girths. Caveson sets. Other fine horse equipment.

SHOW HALTERS

Baby beef, cow, calf or bull show halters. Complete selection of all types. Cow blankets in all sizes.

OTHER BOYT ITEMS

Today, as for the past 49 years, Boyt is still making the strongest work harness in America. Also available are horse collars, body belts, tarpaulins, hunting and fishing equipment, and many other items of particular interest to the farmer and sportsman.

FREE CATALOG — Leading harness, hardware and implement dealers feature Boyt items. For free catalog, write The Boyt Co., Dept. L, Des Moines, Iowa.

BOYT CRAFTSMEN IN LEATHER AND CANVAS WHERE STRENGTH IS REQUIRED

already announced that it will use two of its price support techniques to maintain the price of wheat. Price supports, such as those described for corn, will be offered and an acreage allotment has been declared. Unlike the corn setup there is no commercial or non-commercial wheat areas to be considered. Wheat farmers, whether they live in the big wheat states like Kansas, Nebraska, or Washington, or in Mississippi where little wheat is grown, will receive the support price and be subject to the acreage allotment.

Farm acreage allotments for wheat are determined largely on the basis of planting history, although county and community committee men have some leeway for adjustment. Provision is also made for setting allotments for "new" farms; those that do not have a production history in wheat. Because this regular method of setting individual farm allotments would have worked a hardship in some midwestern areas that have expanded wheat production considerably in the last two years, Congress provided a formula for "summer fallow" farms which serves to set a minimum allotment for these farms in 1950. Additional acreage needed to meet these minimums was added to the county, state, and national allotments. The community committees figured the acreage for every farm in their districts and sent these figures into the County Committee who studied them, made certain adjustments, and notified the farmers. There was, of course, a muffled roar of protest. One County Committee chairman in a wheat area said, "We heard all sorts of griping about the allotments, but very few of the farmers filed formal protests. Among those that protested were a couple who showed us that a mistake had been made in figuring their acreage. We corrected this, of course. With the others we were able to show them what we had to do and they finally agreed that their allotments were fair.

With wheat as with corn, the farmer can secure price support loans or purchase agreements. Since an acreage allotment is in effect, however, the wheat grower must be cooperating with the program to be eligible for either. The County Committee will know if he is cooperating, since, by the time he applies for a loan, the community committeemen will have measured his acreage in wheat to see if he is within his allotment. To qualify for a loan the wheat must be below 14.5 per cent moisture for hard and 14 per cent for soft wheat; it must grade No. 3 or better or No. 4 or No. 5 on test weight alone and cannot be weevily; the granary must pass an inspection and be sealed, but the farmer is paid seven cents a bushel for storing his own grain. Except for these differences the loan procedure is exactly the same as with corn. The dollars and cents support price for wheat is, of course, higher.

This is not the first time that there has been an allotment on wheat. In 1941 and 1942 there was both an allotment and a marketing quota. In figuring the allotment

Mastitis IS BEING CURED

We supply all latest effective treatments including PENICILLIN, AUREOMYCIN, STREPTOMYCIN and "SULFA" drugs to meet all types of the disease. Everything you need in the veterinary line at reasonable prices. WRITE for particulars.

ANCHOR SERUM CO. of IND.
INDIANAPOLIS 6, INDIANA

Townsends NEW HAMPSHIRES
One of The Country's Top Broiler Strains

Lightly colored feathers pop out overnight in this egg laying meat strain. Make ideal hatching egg producers, earning top premiums at quality hatcheries. U. S. Approved—Pullorum Clean, carrying blood of our N.H., U.S.R.O.P. and contest proven families. Catalog free, write

Raymond J. Connor
TOWNSENDS, INC. • BOXFORD, MASS.

20 Million Trees a year

Evergreen Seedlings and transplants as low as $16. per thousand. Also Shade and Hardwood Seedlings, 6 to 10 ft. Fruit and Shade trees. For catalog and Christmas Tree Grower's Guide, write to Box 6-D.

MUSSER FORESTS, INC.
INDIANA, PA.

SAVE YOUR BACK!

PLANTING GARDENS is QUICK and EASY

with this little drill that sows pinches, packets, or pounds without dribble or waste. Indexed for more than 40 kinds of flower and vegetable seeds. Sows, covers, marks next row in one operation. Excellent for distributing fertilizer alongside the row.

PRICES POSTPAID
DRILL only $3.80
with Marker $4.25
with ext. hopper for fertilizer $4.15
with both marker and hopper $4.60

Write for free circular F

SO & SO SEEDER NO. CHATHAM NEW YORK

CROP TIPS For Greater Yields

Just drop a card to SCOTT FARM SEED CO.
Locust St., Mechanicsburg, Ohio

IT PAYS TO SOW Scotts

the farmer is permitted to raise as much wheat on his allotted acreage as he can. If marketing quotas are in effect, however, he cannot exceed this acreage without paying the penalty on his excess production, even if he plans to use the surplus for feeding on his own farm. This point was tested in the Supreme Court in 1942 when Roscoe C. Filburn, a farmer in Montgomery County, Ohio, sued the Secretary of Agriculture for invoking a penalty against the wheat from 11.9 of his 26 acres because it exceeded his allotment, even though he planned to feed the wheat and not market it. In deciding against Filburn, Mr. Justice Jackson stated, "Penalties do not depend upon whether any part of the wheat either within or without the quota is sold or intended to be sold. The sum of this is that the Federal Government fixes a quota including all that the farmer may harvest for sale or for his own farm needs, and declares that wheat produced on excess acreage may neither be disposed of nor used except upon payment of the penalty or except it is stored as required by the Act or delivered to the Secretary of Agriculture." In concluding his decision he stated, . . . "it only appears that if he could get all that the Government gives and do nothing that the Government asks, he would be better off than this law allows."

If enforcing a wheat quota is a headache, the enforcement of a corn quota, where most of the corn is fed on the farm on which it is raised, would be acute migraine. The reason these laws are enforceable at all is that two thirds of the farmers involved must vote in favor of them before they can be imposed. The wheat quota which riled Filburn so much was passed with 81 per cent of the voters favoring it.

Tobacco

The tobacco growers probably know the workings of the law better than any other group of farmers since they have had acreage allotments, marketing quotas and price supports for ten years in a row. In the past the tobacco growers have voted by a majority of more than 90 per cent for quotas, usually imposing them for a three year period. To be eligible to vote in a marketing quota referendum a man must own tobacco land or be a tenant on such land and have an interest in the crop. Before going to vote at the community center where the vote is held, the voter knows what his own acreage allotment will be. One factor that certainly influences the tobacco vote is that if quotas are rejected, price support drops to zero.

After the tobacco is planted the County Committee sends out inspectors to measure the acreage. The fields are measured with a steel tape and the acreage figured down to a tenth of an acre. If a farmer has exceeded his allotment, he is given a chance to turn under the excess or warned that he will face a penalty. Before the crop is ready for market the County Com-

"U·S·S American is the longest-lasting fence I ever used,"

says THEODORE FUNKE
RFD 2, TIPTON, INDIANA

Theodore Funke and son, Joseph, operate 365 acres. They have 10 milk cows, 12 beef cattle, 21 brood sows and market about 225 hogs a year. About 135 acres are in permanent pasture, most of which is fenced with U·S·S American.

6 favorite features of American Fence

"WE'VE HAD AMERICAN FENCE on this farm since 1910, and some of that original fence is still giving good service. We've tried many different brands of woven wire fence but American is the longest-lasting fence we ever used. It helps us get the most out of our pastures and doesn't take long to pay for itself."

Why not try American Fence on your farm. It's strong enough to hold the heaviest cattle and stays tight enough to discourage any hog. Put up the heavy galvanized 9- or 11-gauge fence. You'll save money—and save yourself a lot of work, too. See your American Fence dealer next time you're in town.

1. Long Life Wires
2. Hinged Joint
3. Tension Curve
4. Full Gauge Wires
5. Correct Spacing of Wires
6. Full Length and Height

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO · COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN FENCE

There's more American Fence in use than any other brand!

UNITED STATES STEEL

Get 'em in the bud

Time to dehorn is when calf is 3 to 10 days old. Way to dehorn is with PŌL, the Dr. Hess *chemical* dehorner. PŌL is bloodless. PŌL is painless. PŌL is safe. PŌL doesn't make runny sores. PŌL doesn't burn calf's face or cow's flanks, like old-fashioned caustics.

We think PŌL is by far the best dehorner you can buy. Enough to dehorn 10 calves is $1.25. See Dr. Hess dealer — or write Dr. Hess & Clark, Inc., Ashland, O.

PŌL

NEW AND SAFE DEHORNER

There's always a job...

for

The famous

CHOREMASTER

ONE WHEEL GARDEN TRACTOR

as little as $132.00 Freight Extra

Illustration shows Choremaster with saddle weight for additional traction and cultivating stability . . . available at slight additional cost.

NOW. . . new CHOREMASTER Models . . . 1, 2 and 3 H.P. . . . perfectly suited for your needs. CHOREMASTER lightens and speeds lawn and garden tasks . . . yet this rugged unit provides help for many farm chores, too! Cultivate high growing crops . . . plant closer rows . . . easily turned at row ends. Add low-cost attachments as needed for cultivating, weed and grass-cutting, lawn sweeping, snow plowing, spraying and other tasks.

Write for dealer name and literature showing the many jobs CHOREMASTER does.

ALL SEASON ALL PURPOSE TRACTOR

Spring
Summer
Fall
Winter

NEW CHOREMASTER POWER HOLE DIGGER

Something new. Dig post holes in seconds. No more hand work. Posthole digger is self-contained and portable. Ideal for fast, mechanical digging of post holes.

CHOREMASTER DIVISION

THE LODGE & SHIPLEY COMPANY
806-2 Evans St., Cincinnati 4, Ohio

mittee sends out white cards to each of the cooperators which are attached to the crop when it is sent to market.

Price support with tobacco is worked somewhat differently than with the grains. With this crop the support takes place at the market as it does with cotton and peanuts. The farmer delivers his tobacco to the warehouse with his white card and it is put on the floor and graded by a government inspector. Later the buyers come through and the auctioneer sings his unintelligible chant. Bids are made and the highest bid recorded. If the highest bid falls short of the support price, the farmer is paid the support price by the warehouse and the tobacco is set aside to be processed and brought into better condition. It is then offered for sale at the support price plus the processing fee. If more than this amount is bid on the tobacco, the farmer who grew it is paid the extra amount over the support, processing and handling figure.

When tobacco arrives at the market without the white card of a cooperator, the penalty of 40 per cent of the previous season's average price for all excess is collected before the farmer is paid. The penalty is levied proportionately against the total crop to prevent the farmer from setting aside his worst tobacco and claiming it was the part that was grown on the extra acreage.

Supporting Perishables

A somewhat more complex program is necessary to support the prices of milk, vegetables and other perishables. The program usually begins with a price-stabilization program carried out by the producers themselves. The operation of a milk order is an example of this. The milk producers in a given marketing area may sponsor a program for the orderly marketing of their product and request the Secretary of Agriculture to hold hearings on the program. At these hearings the producers, handlers, and the general public participate and state their opinions on the program. The Secretary then issues a milk order and producers are permitted to vote on it. Over two-thirds of the producers are required to vote in favor of the order for it to be made effective. Among other regulatory matters the order will peg the price of whole milk at a certain figure, say $1.35 per hundred pounds, above the cost of milk used to produce butter or milk powder. Though there is nothing directly in the order on the support price, there is indirect support since the government supports the price of butter, cheese and milk powder by making an offer to buy these by-products at support level. At present there are thirty-five milk marketing areas in the country that are covered by individual orders.

The potato program is operated in a similar manner with the addition of acreage allotments as a check on over-production. The potato growers in the various sections of the country where potatoes are produced commercially agree to withhold from market any of their crop that does not meet a certain standard and the government agrees to buy their excess potatoes at support price when the free market cannot absorb them. The potato program has been costly since the income from the sale of surplus potatoes has not nearly equalled the amount the government spent for them. Surplus potatoes are used for livestock feed and in the manufacture of starch, alcohol and flour.

What Is Parity

Parity is the relationship between the price received by farmers for their products and the amount they must pay for needed supplies during a given base period. Historically the base period for most crops has been August, 1909, to July, 1914. The average prices received by the farmer for his agricultural commodities during this period have been computed and related to the cost of 175 items that he had to buy. During this base period parity is considered to be 100. Thus, if it took the price a farmer received from the sale of 750 bushels of wheat to buy a tractor during the base period, he would have to be able to make the same exchange now to maintain parity at 100. The 175 commodities that are used in the parity formula, are divided into two groups, 86 items which are used in living, such as food, clothing, furniture, motor vehicles and building materials; and 89 commodities used in production such as feed, farm machinery, fertilizers, seed and the like. The period from 1909 to 1914 was selected as a base period since it was felt that this was one of the most stable periods in our recent history as far as the relationship between agricultural and industrial prices was considered.

Some important changes have been made in this parity formula. One important item, wages, has been added to the cost side of the equation. Since labor is now costing farmers five to six times what it did in 1909 or 1914, this should make for a higher parity figure. But more important than this addition is a change in the base period that will be used in figuring parity. Instead of the 1909-1914 period, there has now been set up a new base period which will change from year to year, since it is the last ten years before the crop year for which the parity figures are being computed. In most cases this new parity formula will be more favorable to farmers. With wheat, corn, cotton, and peanuts, however, the new formula will not produce a parity price that equals the old. Congress has decided that in these cases the Secretary of Agriculture shall use the higher of the two parity figures for the next four years. It is expected that by 1954 the new and the old parity prices will have about equalled, but in any event, it is the intention of Congress to put all agricultural commodities onto the new formula at that time.

You Can't Get TOP YIELD Without Soil Tests!

Get BIGGER Crops with the Sudbury Soil Test Kit

even on Reduced Acreage

You just can't get top yield from any soil without soil tests. Because without testing your soil you don't know what it lacks. All Soil Authorities agree that a crop grown in soil lacking even *one* of the three main plant foods — nitrogen, phosphate or potash—will not be a *full* crop. Your soil may lack all three!

With the Sudbury Soil Test Kit you can tell exactly the kinds and amounts of fertilizer you need for top yield. Also, tells you whether lime is needed on a field, and how much for any crop. You'll take a bigger yield off two acres this year than you did off three last year—where plant foods were not properly balanced—and build up your soil at the same time.

And you can check your crops while they are growing—supply additional nitrogen, phosphate or potash whenever needed.

Sudbury SUPER-DELUXE Model

Simplicity and reliability are the keynotes of this handy new Sudbury Soil Test Kit. It contains all the equipment necessary for you to make hundreds of tests of your soil for Nitrogen, Phosphate, Potash and Acidity or pH (whether lime is needed and how much.)

Streamline all-welded steel chest, 18¼ in. x 5¼ in. with carrying handle. Built to last a lifetime. Complete directions include charts indicating needs of 125 different crops. Price just reduced from $27.50 to a new low of only **$24.95.**

Refill solutions available

Money-Back Guarantee

These Farmers Tested Their Soil — Increased Yield up to 100%

A Wisconsin farmer inherited a cropped-out farm. He tested the soil of every field, added the correct amounts of the right fertilizers.

His grain yield jumped from 700 bushels on 30 acres to 1350 bushels on only 25 acres. 17 of his cows now give more milk than 23 did before he fertilized his pasture.

In Pennsylvania farmers report that soil-testing upped their wheat yield from 34 to 52 bushels an acre.

Another farmer, W. M. of New York, increased his tomato yield from 8 tons per acre to over 22 tons per acre.

J. H. B. of New Hampshire doubled milk production, cut grain cost by 50%.

No Knowledge of Chemistry Needed

Your Sudbury Soil Test Kit utilizes basic scientific principles of soil experts, yet you don't have to know a thing about chemistry to make quick, accurate tests. No one need show you how.

Just mix soil and testing solution in a test tube, and compare the color of the liquid with a transparent color chart. You get the right answer from the soil itself!

Soil-Testing Pays Off!

—Photo Courtesy Wisconsin Agricultural Experiment Station

As this picture shows, even after liming and using phosphate where soil tests showed they were needed, also adding nitrogen and potash raised corn yields greatly. Balanced fertilizer guided by soil tests can produce over 100 bushels per acre, even up to 150!

Make up to $50 for Every Dollar Spent on Soil Testing

According to well-known agricultural authorities, farmers get a $50 profit for every dollar they spend on soil-testing. These same authorities state that in one state alone, farmers waste $5,000,000 each year by failure to test their soil.

By soil testing you actually get up to $3 back for every dollar you spend on fertilizer — enough to pay the cost of the Sudbury Soil Test Kit many times over, in just one season.

Accurate 10-Minute Soil Test Costs less than 10c

It takes you just 10 minutes to make a complete soil test with the Sudbury Soil Test Kit. And you can make it at less than 10c a test—less than the cost of mailing soil samples to a laboratory.

At the time you want your soil tested, your neighbors do, too. When you do your own testing there's no waiting around for reports . . . no carrying of samples to town or mailing to be done. You can test in the field or indoors, anytime and anywhere you want.

Test NOW for Spring Planting

Make your Sudbury soil tests now, whenever you can get soil samples from the field. Test now, so that when you plan your fertilizer and liming needs you'll know how much to put on each acre—buy just the kinds and amounts of fertilizer you need. Unless you test, you're just guessing and guesswork costs you money!

Over 125,000 Kits Now in Use!

Easy to Use

Sudbury Laboratory
Box 132, South Sudbury, Mass.

Order Today

SUDBURY Soil Test Kits

Dealers Write for Special Offer!

World's Largest Makers of Soil Test Kits

Famous SUDBURY Better Crop Guarantee

Your money back anytime during the year if you do not get a better crop by using these soil tests.

You be the judge—we know you'll never part with your Sudbury Kit.

You take no risk!

SUDBURY LABORATORY
Box 132, S. Sudbury, Mass.

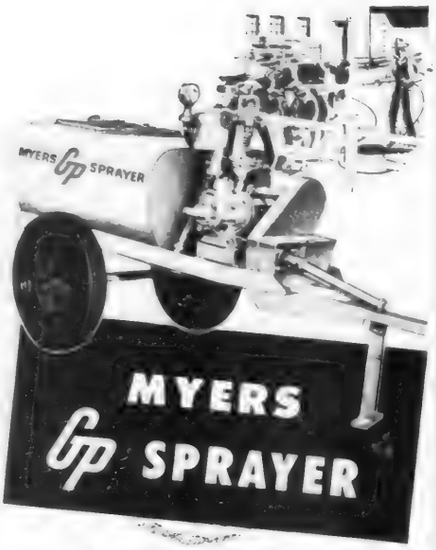
Send the Super deLuxe Sudbury Soil Test Kit at the new special reduced price of $24.95.

☐ Enclosed $..... Send prepaid. ☐ Send C.O.D. plus postage

Name .....

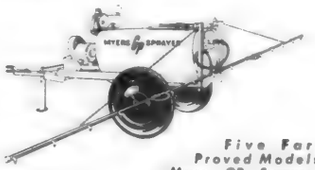
R.D. or St. .....

City ..... *State* .....



All-season service . . . and Savings!

Throughout growing seasons a Myers GP Sprayer provides low-cost profit protection—fast, thorough dormant-to-harvest spraying for all kinds of crops. And there's sudden death for all livestock pests in its double-geared Bulldozer Pump—driving power to reach deepest imbedded grubs. Also permits easier, cheaper handling of scores of "between season" chores. Adjustable pressures of 30 to 400 lbs. for wide range of jobs —such as weed control, whitewashing, disinfecting, fire protection. Resistant-welded steel tank is non-absorbent, quickly filled and cleaned. Many other special advantages for all-season spraying efficiency. Mail coupon for free books.



Five Farm-Proved Models—Myers GP Sprayer is available in wheel and skid types, power take-off and engine-driven; for gun or boom operation. Compact, durable. Capacity, 7 gpm.

Full Range of Myers Power Sprayers—capacities to 50 gpm., pressures to 800 lbs.—with matching accessories to meet every need. Lighter, more powerful Bulldozer Pumps on all Myers Power Sprayers.

TAKE OUR TOUR MAY TO MYERS

THE F. E. MYERS & BRO. CO.
Dept. R-154, Ashland, Ohio

Send free literature on items checked below.

☐ Water Systems ☐ Power Sprayers
☐ Power Pumps ☐ Hand Sprayers
☐ Hand Pumps ☐ Hay Unloading Tools
☐ Water Softeners

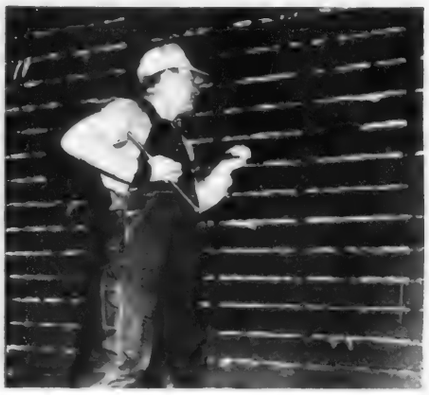
Name_____

Town_____ State_____

County_____ R.F.D._____

Farmers Elect Administrators

The task of setting farm allotments, policing marketing quotas, approving loans and purchase agreements and the other work involved in the price support program is carried out through an unusual administrative setup. The responsibility for the entire program rests with the Secretary of Agriculture who makes use of the Production and Marketing Administration, a division of the Department of Agriculture, to carry out the work. The



THE FIRST STEP toward a loan is sampling.

financial aspects of the program are handled through the Commodity Credit Corporation. The C.C.C., however, is authorized and does use the staff of the Production and Marketing Administration to carry out its field work and designates local banks to handle its disbursements.

In each state the Secretary of Agriculture appoints a Production and Marketing Administration Committee of three to five farmers to carry on the work. Within each state the administration is further broken down into three-man County Committees who are assisted by three-man Community Committees. The Community Committees are elected directly by the farmers in the community from among their own ranks. A "community" may be a township or more than one township or it may be a geographical area within the county. The County Committee is selected by delegates elected by the farmers and sent to a county convention for this purpose. To prevent log rolling, there is a rule that no delegate is eligible for a job as County Committeeman. The men who serve on the Community or County Committees must, by law, be farmers.

With the administrative apparatus brought down to a neighborhood level, the laws that govern price supports can be administered with understanding and sympathy for local problems. When acreage allotments are to be imposed the members of the Community Committee who know the history of every farm in their area, make recommendations to the County Committee which are usually accepted and made official. Any farmer may, of course, appeal these decisions to the County Committee and on up through the State Committee to the Secretary of Agriculture

GROW STARTED CAPONS For YEAR 'ROUND PROFITS

No worry about changing markets, seasonal slumps, when you raise capons. They're always in demand at premium prices.

We offer 4-week-old specially bred cockerels already caponized (surgically) and ready to make money for you. Saves you time, labor, and fuel. With reasonable care they reach 9 lb. weight five months after you receive them. Large-bodied, plump-breasted birds with extra fine flavor,—tender, sweet, and delicious meat. Economical too—these 4-week-old capons cost less than day-old turkey poults. Order some this year for greater meat profits!

Write today for full information and prices.

Box F, Kingsley, Pa.

Wilmarth POULTRY FARM

FREE BOOK

RAISE HAMSTERS

The new wonder animals from Syria. Often called Toy Bears. Delightful pets... Everyone wants them... Laboratories need thousands. Clean, odorless. Raise anywhere. Profitable and interesting. Write today for free illustrated literature.

Gulf Hamstery, 1539 Basil, Mobile, Ala.

LEARN POULTRY AT HOME

Poultry provides a good full-or part-time income for thousands of men and women. Through training and "Know-How" can mean the difference between success and failure. That's why thousands have obtained their poultry education from N.P.I. home-study courses during the past 29 years. Courses are easily understood, interesting, practical—bring students the hard-earned experience of experts in every phase of this $3½ billion industry. If you have chickens, or wish to enter the poultry business, you should get our free catalog describing courses, methods, service, opportunities. Write today to Charles N. Burmaster, Mgr., Dept. 65.

Write for Free CATALOG

NATIONAL POULTRY INSTITUTE Adams Center, N.Y.

Orlyt GREENHOUSE $425

Comes in sections that go together with bolts and screws. Easy to put up anywhere, any time. $425 buys the 10 by 11 ft. Orlyt pictured ready to go on your foundation. Other basic Orlyt models from $190. Automatic heat and ventilation at reasonable prices. Convenient terms available. Send for fascinating booklet, No. 23.

Hand Book—"Greenhouse Gardening For Everyone." 226 pages—well illustrated—postpaid, $4.00.

LORD & BURNHAM
IRVINGTON, N. Y. DES PLAINES, ILL.

if he feels that he has not been treated fairly. One such farmer in Kentucky appealed his tobacco allotment every year for three years without avail. He then got himself elected to the Community Committee who recommend the size of the allotment. After studying the total allotment for the community and the distribution of the acreage among the farms he, somewhat sheepishly, recommended that his own allotment remain the same as before—the thing he had been fighting against so vigorously for three years. These men, working on the neighborhood level, *know* what acreage each farmer is planting and it is next to impossible to fool them by hiding out an extra plot up in the east forty.

How Can You Lose?

Even with a firm price support program there is still plenty of room for poor farmers to fail and good farmers to forge

THE BANKER PAYS the loan for the C C C.

ahead. To take advantage of price support the farmer must first have a crop to sell. The amount of a crop he produces on his allotted acres is still largely governed by the skill and understanding of the farmer. National figures show that with corn, for example, the best farmers will get from five to ten times the crop from an acre as the poor farmer. Furthermore to get price support the crop must be in deliverable condition. Damage to the crop in storage when a price support loan is in effect is charged against the farmer unless he can prove that it was what amounts to an act of God. And finally, a farm with too little good acreage to raise a sizeable crop won't benefit much by price support.

Dangers

Each of the last two years the government has taken millions of bushels of wheat and corn and tons of other crops off the market through loans and purchase agreements. Congress has wisely restricted the Department of Agriculture in disposing of this crop by making it impossible for them to dump it onto the market and further depress prices. The Department must sell at a figure that is five per cent above the support price and storage fees that have accrued. The Department is permitted to sell at a lower figure if the crop is exported. It is also permitted to make gifts of the crop for use in the school lunch program and for taking care of the needy. And it may also permit the Munitions Board to use the crop for bartering purposes in securing scarce armament materials for stock piling. But even with these outlets and with acreage control there is the danger that two or three bumper crops can swamp us. On the other hand we found at the beginning of the war and after the 1947 corn failure that a sizeable surplus was our salvation.

Though the vast majority of farmers appear to be in favor of the government's price program, there are many who feel that the future dangers outweigh the present benefits. J. M. Whipple, the owner of a fruit and swine farm in Springhill, Louisiana, is one of the farmers who doubts the wisdom of the program. "My miff," he says, "is with this pretense of helping the farmer, giving him something for nothing and making dole seekers of too many of them for which the remainder will never be able to pay out."

The most articulate of the critics is probably Louis Bromfield who has written in his newspaper column that the price support programs "have about reached that degree of absurdity which may cause a violent and perhaps expensive reaction (1) either in the direction of the phony Welfare State economics of the Brannan Plan or (2) in so violent a reaction that farmers may find price support programs pulled from under them without warning and with accompanying disaster to the economy of the rest of the nation."

The Future

Though both major political parties favor price supports at the present time, there are great differences in opinion as to how the law shall be written. The farmer naturally wonders if the changes in the law that are bound to come will affect the step by step methods that he has become accustomed to following in securing price support. On this question, Senator Clinton Anderson, who is one of the major figures in agricultural affairs in Congress says, "So far as I can foresee there will be no changes in the price support legislation that will require procedural changes as far as the farmer is concerned."

The Secretary of Agriculture, Charles Brannan, who has recommended the most drastic changes that have been presented to Congress, emphasized this point, "If my proposals to Congress, the so-called Brannan plan, were adopted, the administrative organization and the procedures we have developed would remain the same. We have, over the years, developed workable procedures and an efficient, democratic administrative set-up, and have no intention of scrapping them."

Myers water systems

Most Service—with Least Servicing

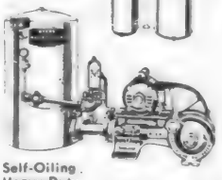
New! Myers "HN" series Ejecto Greater capacities at higher pressures. Easily convertible for either shallow or deep wells. Many money-saving features include: positive air control; non-clogging nozzle; non-corrosive Ejectors; all threaded connections. More water per dollar—ask your Myers dealer for proof!

Complete Myers Line Covers Every Need!

Vertical Type Ejecto for Deep Wells

New! Myers Water Softeners

Self-Oiling Working Heads for Extreme Depths



Self-Oiling, Heavy Duty Bulldozer for Shallow Wells

Reciprocating Type for Shallow Wells

Don't let pump failure "bottle-neck" *your* farm production! Depend on a Myers Water System to put that trouble behind you—and put you many dollars ahead. Comparison proves that Myers owners enjoy *more* years of care-free, repair-free service, at *lower* operating costs. It also proves your Myers dealer best equipped to meet your exact needs—with *Ejecto* and Reciprocating Types to match every well condition and volume requirement. See him soon. Mail coupon today.

MYERS

THE F. E. MYERS & BRO. CO.
Dept. R-60, Ashland, Ohio

Send free literature on the following:
☐ Water Systems ☐ Power Sprayers
☐ Power Pumps ☐ Hand Sprayers
☐ Hand Pumps ☐ Hay Unloading Tools
☐ Water Softeners

NAME_____
TOWN_____ STATE_____
COUNTY_____ R.F.D._____

VOGEL
PATENTED

FROST-PROOF HYDRANT

- Will never freeze when properly installed.
- Running water available all year 'round.
- Reduces fire hazard.
- Increases operating efficiency.
- Over a million Vogel Frost-Proof Closets and Hydrants have been sold.

The handle in this position shows at a glance that the water is positively shut off and is your guarantee against freezing and leakage.

★

VOGEL No. 4 FROST-PROOF CLOSET

Will never freeze when properly installed. A great convenience when installed in an out building or on a rear porch of a residence.

Vitreous China bowl is very durable and easy to keep clean. It is so constructed that it will never freeze. No Mechanism in tank to get out of order.

For information, see your nearest Plumbing Supply House — or if you write us direct, state the county in which you are located.

JOSEPH A. VOGEL CO. WILMINGTON 99 DELAWARE

PETER HENDERSON'S Library of Helpful Pamphlets

for Home Gardeners

---They're FREE!---

Check the ones you want. Send your list today.

ON FLOWERS:

- ☐ Plans for perennial gardens and cultural information
- ☐ Garden culture of the rose
- ☐ Summer flowering bulbs—their culture in the garden
- ☐ Herbaceous Peonies—Planting and cultivating
- ☐ Dahlia culture

ON VEGETABLES:

- ☐ Growing quality vegetables on a small plot
- ☐ Garden culture of root crops
- ☐ The culture of cabbage, cauliflower, broccoli, etc.
- ☐ Salads—growing and blanching
- ☐ The culture of bush fruits and vines

PETER HENDERSON & CO.
38 Henderson Bldg., 35 Cortlandt St., N. Y.

Please send me the pamphlets I have checked above. Free of charge. (note: no more than 1 set of 10 to one person)

Name_____

Address_____

City_____ State_____

YOURS FOR THE ASKING FILL IN THIS COUPON NOW!

THE TAG ON THE BAG

(Continued from page 37)

Total Feed Requirements for Dairy Animals

Starting Calves....400 lbs. feed first 4 mo.
Growing Stock
From 4 to 18 mo., 3 lbs. per day
Dry Cows.....6 to 8 lbs. daily
Milking Cows.....Rule of Thumb Feeding Recommendations

Feed one pound grain ration to each

4 lbs. of milk for Holsteins
3½ lbs. of milk for Ayrshires
3½ lbs. of milk for Brown Swiss
3½ lbs. of milk for Milking Shorthorns
3 lbs. of milk for Guernseys
3 lbs. of milk for Jerseys

Proteins are tricky and complex chemical compounds. When they are produced by animals or plants, they are made up of substances called *amino acids*. These amino acids play an extremely important part in animal nutrition, because it is from them that the animal builds its body and also builds its production of meat, milk or eggs. There are about 22 of these amino acids and they are commonly spoken of as "the building stones of the body."

Ten of these 22 building stones are known as *essential!* This is because they must be supplied to the animal in the feed; there is no other way they can be gotten into him. The other 12 "building stones" are *non-essential*. This is because they can be made in the animal's digestive tract from other substances.

Sometimes feed dealers and nutritionists refer to "high" quality and "low" quality protein. Whether a protein is classed as high or low quality depends entirely upon the balance of amino acids or "building stones" within that protein. A protein that is made up of amino acids in the proportion to fill most of the needs of the animal is said to have high quality. A protein source that does not carry the building stones in the proportion needed by the animal is said to be of poor quality.

The reason that good mixed feeds contain protein from a variety of sources is because few single sources contain all of the building stones in the amounts and proportions needed by farm animals. If the amino acids are not balanced and all the essential types present in the feed, the animal suffers and will not do well. The amino acids are practically useless unless they can work as a team. They supplement each other just as the players on a well trained ball team. For any ball team to go on the field minus one or more players would weaken the individual efficiency of the players who were on the field, even though each is a star. The same is true in nutrition. If a ration is lacking in one or more of the 10 essential building stones, the efficiency of the stones that are present is greatly reduced as

Hamprace Hogs

(or Montana No. 1)

"The New Look Hogs"

Excellent records of litter size, cost of gain and carcass yield.

Solid black in color—good mothers—great foragers.

Breeding stock all ages now available, write for illustrated literature and prices.

FARM SERVICE & SUPPLY CO.
Box 178 Alden, Iowa

Join the ranks of Successful Breeders Using—
BREEDER-ADE® OIL

...for surer pregnancies...for better young

Follow the lead of successful breeders in all parts of the country—feed Breeder-ADE Oil before mating. This blend of carrot oil, wheat germ oil and "D" activated animal sterol successfully combats nutritional sterility. 4 oz. only $1.80 postpaid!

Put Breeder-ADE Oil in feed of horses, cattle, swine, dogs, poultry and fur-bearers. Dosage varies according to size of animal—follow simple directions in Bulletin 23 sent in each package. Orders shipped same day received. Send check or money order for $1.80. Money back if not satisfied. Breeders who have tried it reorder year after year.

NUTRITIONAL RESEARCH ASSOCIATES
SOUTH WHITLEY, INDIANA

Department A-3, ®Trade Mark

for SOIL CONSERVATION PRACTICES

Save and protect your valuable surface soil. The Danuser All-Purpose Blade does the job—terracing, grading, scraping, back-filling and bull-dozing! Easily attached to most popular tractor models; fast one-man operation. Dependable and rugged—the Danuser Blade is a practical, economical short-cut in farming. Write Dept. U.

DANUSER MACHINE CO., Fulton, Mo.

DANUSER ALL PURPOSE **BLADE**

Also Manufacturers of the Famous Danuser Digger

well as the efficiency of the overall ration. That is why it is so very important that a ration be *completely balanced* from an *amino acid* standpoint and not just partially balanced. The presence of nine out of ten amino acids *does not* give 90 per cent efficiency.

Carbohydrates

The carbohydrate portion of the ration is used by the animal to produce heat and energy. This heat and energy is needed by the animal so that it can move about, breathe, digest its food, and keep itself warm.

Carbohydrate feedstuffs, like protein feedstuffs, range from low value to high value. A low value carbohydrate is one carrying excessive amounts of hard-to-digest fiber, such as corn stalks, stemmy hay, and hulls. High value carbohydrates are those carrying a minimum of hard-to-digest materials. Wheat and corn are high value carbohydrates. Carbohydrates not only supply heat and energy, but they go into the production of fat. If an animal is fed more carbohydrates than is needed for the life processes, the surplus goes into fat. That is why we pour the corn to hogs being fattened for market.

Fat

The third basic food nutrient is fat. Fat performs the same duties in the body of animals as carbohydrates. The fat portion of the ration, however, is 2¼ times more potent than the carbohydrate portion. Another way of saying this is that one pound fat will supply as much heat and energy to the animal as 2¼ pounds carbohydrate. This immediately raises the question, "Why not feed large amounts of fat and a small amount of carbohydrates?" Farmers would like that but unfortunately the animals wouldn't. Their digestive systems aren't geared for too much fat, which is difficult to digest in large amounts. To try to use fats in excessive amounts only throws the animal off feed, which is costly. Humans are no better off than animals in this respect. The consumption of bicarbonate of soda following fall butchering is enormous. Too much freshly killed fat pork will upset the strongest stomach. High producing milk cows have been known to go off-feed when changed from a balanced ration to one made up largely of ground soybeans. The ground soybeans are high oil (fat) carriers and cannot be used as such in large amounts.

Fat carried in the ration over and above that needed for the animal for living is stored in the body as fat flesh.

Minerals

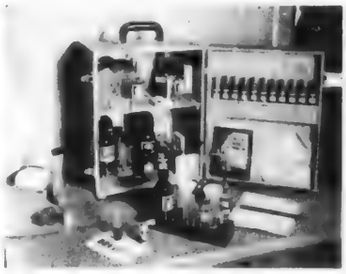
Nutritionists are pretty well agreed on how much fat, carbohydrates and proteins should go into a ration, but that agreement ends when they get on the subject of minerals. The curbstone opinions about minerals are as varied as they are enormous. In order to tie down some

TIME PROVEN *LaMotte*

SOIL TESTING APPARATUS

The result of 30 years of cooperative research with agronomists and expert soil technologists. Methods used are based on fundamentally sound chemical reactions adapted to the study of soils, and have proved invaluable aids in diagnosing deficiencies in plant food constituents. Used by farmers the country over. So simple to operate that 4-H clubs use it in their soil testing projects.

LaMotte Combination Soil Testing Sets



Each outfit is a complete Soil Laboratory, ready to use on prepared soil samples. All equipment is compactly arranged in convenient open front cases. Reagents, glassware and color charts for each test are stored in individual racks which may be removed and placed at the convenience of the operator while making the tests. Sufficient quantities of reagents are supplied for making approximately 100 tests for each element. Refills of reagents and other parts are available for immediate shipment.

AVAILABLE FOR IMMEDIATE SHIPMENT (ORDER BY NUMBER)

No. ST-1004, *tests for pH (soil acidity), Phosphorus, Potassium, and Nitrates. Price complete — $38.50 f.o.b. Towson, Md.*

No. ST-1005, *tests for pH (soil acidity), Phosphorus, Potassium, Nitrates, and Replaceable Calcium. Price complete — $45.00 f.o.b. Towson, Md.*

No. ST-1013, *tests for the 13 major and minor elements: pH (soil acidity), Phosphorus, Potassium, Nitrates, Calcium, Ammonia Nitrogen, Nitrite Nitrogen, Iron, Magnesium, Manganese, Aluminum, Sulfates, and Chlorides. Price complete — $82.50 f.o.b. Towson, Md.*

LaMOTTE CHEMICAL PRODUCTS COMPANY

DEPARTMENT FQ TOWSON, BALTIMORE 4, MARYLAND

FREE INCOME-BUILDING IDEAS FOR BREEDERS AND DAIRYMEN

GUERNSEY INFORMATION KIT

Whether or not you own Guernseys, you'll find valuable tips on breeding and milk production in this complete 1950 Kit, available through the American Guernsey Cattle Club.

Packed with practical facts and figures and market data — this timely Kit will prove useful to anyone interested in breeding, buying, selling or dairying.

And remember, Guernsey Cattle and premium-priced GOLDEN GUERNSEY Milk have proved a *dependable* source of better income in countless cases.

FREE INFORMATION KIT

MAIL COUPON TODAY

The American Guernsey Cattle Club
506 Grove St., Peterborough, N. H.
Please send me free of charge the 1950 GUERNSEY Information Kit:
Name.....
Address.....
City..... State.....

THE AMERICAN GUERNSEY CATTLE CLUB

First thing this Spring...

CUT OUT THE ROUGH STUFF

The weeds'll be back full force in the spring . . . but you can lick 'em easy with Jari. It kills weeds two ways! Its yard-wide sickle bar slices through the toughest growths . . . and its 14 foot weed spray attachment covers your lawn or garden fast . . . keeps weeds from coming back. Cut fencerows, ditch banks . . . spray insecticides in row crops, truck gardens with this light, nimble new Jari. Write for your dealer's name now. Be ready for spring.

JARI PRODUCTS, INC.
2938 Pillsbury Ave., Minneapolis, Minn.
Direct Factory Franchises Available

Jari POWER SCYTHE

New Jari Pressure Spray Attachment. Holds 10 gallons . . . sprays 14 feet wide.

X

Brahman CROSSBREEDING Builds Better Beef

Brahman X = Rapid Growth, High Dressing Percentage, Heat Tolerance, Unsurpassed Disease Resistance, Insect Resistance, Longer Productive Life . . . and Rangeability.

The U. S. Dept. of Agriculture has proved Brahman crossbreeding value. Brahmans crossed with non-Brahman breeds give stronger offspring showing great hybrid vigor. For information on America's finest Brahmans, write for packet "J".

NORRIS CATTLE COMPANY
R. G. "Bob" Herrmann, Gen. Mgr.
Box 1051 Ocala, Florida.

facts let's take a look at the function minerals perform in the animal body. The framework of any animal, whether it be beast or fowl, consists of the skeleton which is built from the mineral matter that goes into the animal's digestive system. Minerals are also found in the blood stream in varying quantities as well as in the fleshy parts of the body.

There is virtual agreement that there are 13 minerals essential for the well-being of animals. These are: Sodium, chlorine, calcium, phosphorus, iodine, iron, copper, manganese, cobalt, sulfur, potassium, magnesium and zinc. There is only partial agreement that there may be a few minerals in addition to the commonly accepted 13 that are also important in good animal health. The fact that 13 minerals are essential for optimum animal health does not mean that they must always be added to the ration for livestock. Some of them are needed only in trace amounts and some are carried in the other ration ingredients.

Sodium and chlorine, because they combine to form common salt, are usually considered together when discussing the needs of livestock for minerals. All animals need salt in addition to that carried in the feeds they eat. Animals that are salt starved grow and develop unsatisfactorily. A very delicate balance exists among the various bodily fluids and salt is of prime importance in keeping this balance. The accepted way of getting this needed salt to farm livestock is to offer it as common salt of a livestock grade.

Two other minerals which are usually considered together are calcium and phosphorus, because these two minerals make up over 90 per cent of the animal skeleton, and about three-fourths of the mineral matter in the entire body. Both minerals are fed in ration mixtures. Ground limestone and steamed bone meal are two of several sources.

Iodine is important in animal rations because the activity of the thyroid gland in the neck is dependent upon this mineral. When too small amounts of iodine are present the thyroid gland enlarges in an attempt to produce more of it and the result is goiter. Hairless pigs are an indication of iodine deficiency. There are many areas in the country where the soil contains insufficient amounts of iodine to fortify the crops. Because of this it is necessary to add iodine to the stock rations. Iodine is supplied to the ration through iodized salt or perhaps potassium iodide.

Iron and copper are two other minerals which work in close cooperation with each other. An adequate supply of iron is a must because it is one of the main constituents of the hemoglobin in the blood. The hemoglobin is an iron compound in the red blood cells which carries oxygen throughout the body. When too small a quantity of iron is present, an anemic condition develops which can soon cause severe unthriftiness or death. In addition to the iron small amounts of copper must

PARAGON SPRAYER

Handles 12 gallons of any spray solution. Kills pests and parasites on plants, trees, poultry and livestock. Destroys weeds. Whitewashes buildings. Automatic agitation prevents solution from settling in tank or clogging nozzles.

No. 3 $29.95 with hose, pipes and nozzles.

Air Gauge $2.60 extra.

ELIMINATE CONTINUOUS PUMPING

Model 3-P with 4-gallon compression tank, assures continued spray at high pressure long after pumping stops. It's strictly a "one man job", easy, fast and thorough. Price with gauge, pipe, hose and nozzles $44.95.

Ten day trial with money-back guarantee. Order today.

THE CAMPBELL-HAUSFELD CO.
21 State Ave. Harrison, Ohio

AT THESE PROFITABLE . . . .

Sheley's BROAD-BREASTED WHITES

Here are popular-sized birds (table dress at 11-22 pounds) . . . . . with real bred-in Broad-Breasts . . . all combined in a turkey with superior-dressing, white feathering.

Also BROAD-BREASTED BRONZE & SMALL WHITES

Write For Our Turkey Book

SHELEY TURKEY FARM
BOX B NEW CARLISLE, OHIO

FARM AND HOME "HANDY PUMP"

An all 'round ¾" pump for farm and home utility use. Weighs only 20 pounds—self-priming. Fits pipe or garden hose. 8 GPM at 40 lbs. pressure (more at lower pressures). Lifts up to 25 ft. Electric. Complete. Guaranteed.

HANDY

Gorman-Rupp Pumps are made in all sizes from the Handy and Midget up to irrigation pumps delivering 1000 GPM at 100 lbs. pressure.

The MIDGET 1½" pump—weight 60 pounds. Pumps 5500 GPH . . . Self-primes to 30 feet . . . non-clogging . . . trouble-free.

MIDGET

Send your name on a postcard for complete literature.

GORMAN-RUPP PUMPS

THE GORMAN-RUPP CO.
MANSFIELD OHIO

be present to make possible the formation of the hemoglobin even though the copper is not an actual part of this compound. Iron and copper salts are the sources of these two minerals most commonly used.

Manganese is essential for animals but only traces are needed. With the exception of poultry, which require it in larger amounts than other animals, sufficient quantities are usually found in the natural feedstuffs. Minute amounts of manganese help prevent slipped tendon (perosis) in chickens and may aid in the hatchability of eggs. Manganese sulphate is most commonly added in feeds as the manganese carrier.

In recent years it has been found that some of the most severe troubles with cattle, sheep and goats has been due to cobalt deficiency. Before the true cause of the trouble was known, ailments stemming from cobalt deficiency were variously called salt sickness, bush sickness, and others. The addition to the ration of minute amounts of cobalt will correct these difficulties in a very short time. The forms of cobalt used most frequently in livestock rations are cobalt sulphate, cobalt carbonate, and cobalt chloride.

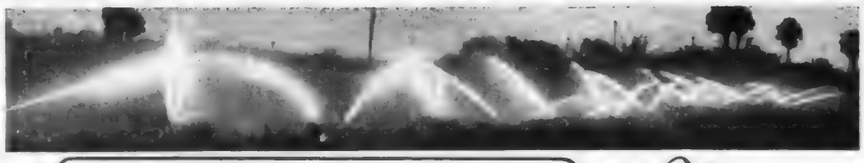
The remaining four minerals of the 13 originally mentioned are sulfur, potassium, magnesium, and zinc. These four minerals are often present in the feeds fed to farm animals in sufficient amounts to take care of their needs.

Other minerals than the 13 mentioned may be of significant importance in livestock feeding, but their functions in the body and the symptoms of deficiency are yet relatively unknown. Some farmers are feeding salt fortified with trace minerals (cobalt, manganese, iron, copper, iodine). Such mixtures are called "trace mineralized salt," and are available commercially.

Vitamins

Future historians will likely be tempted to brand this the "Vitamin Age." The crowded shelves of brightly colored capsules, tablets, powders and liquids which every drug, dime, and department store displays to the confused buyer are evidence that vitamins are big business if nothing else. These very necessary nutritional ingredients of the food of both man and beast are precariously near to being overpromoted. Some animal nutritionists and feed makers who are promoting vitamins are having a hard time keeping their feet on the ground. Perhaps in the shakedown, when the hysteria of a new discovery wears off, vitamins will emerge in their true value and we'll know enough about them to use them profitably and efficiently.

Vitamins are not cure-alls; they are necessary to human and animal health, and when there is a deficiency in the ration they should be added. But too many expect miracles from them and attempt to cover deficiencies in other nutrients with shotgun mixtures of vitamins.

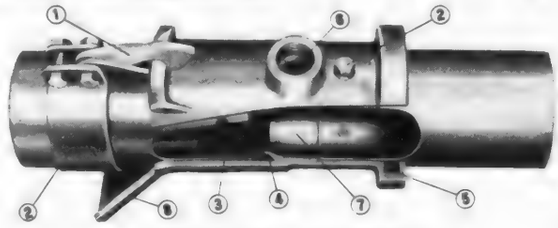


SOONER OR LATER YOU WILL FIND IT PROFITABLE TO OWN A SPRINKLER IRRIGATION SYSTEM. WHEN YOU DO, BUY THE BEST BY TEST: A SYSTEM EQUIPPED WITH IRECO COUPLINGS. VALVES AND FITTINGS MADE OF ALODYNE TREATED ALUMINUM!

SEND FOR NAME OF NEAREST DEALER

QUICK COUPLINGS MAKE PORTABLE IRRIGATION POSSIBLE, DEMAND THE BEST..... IRECO

The Famous IRECO Coupler (formerly named Stout)



LOOK AT THESE ADVANTAGES

1. **Hook and Stabilizer,** positive automatic lock, prevents rotation of pipe. Sprinklers cannot tip.
2. **Attachment of coupler and band** to tubing made possible by common hand tools. Easy adjustment or replacement. May be re-used on new tubing.
3. **The famous "IRECO" gasket.** A positive seal at all pressures. Protects tubing ends and provides for easy engagement of joint.
4. **Shroud ring.** Positively retains gasket for streamline water flow. No pockets or crevices to accumulate sand and dirt.
5. **Seal rings** provide positive seal at all pressures.
6. **Threaded Sprinkler Outlet** for 1" pipe. An integral part of coupler, can be plugged when sprinkler is not attached.
7. **Streamlined Water Flow.** Internal streamlined design of coupler and gasket leaves *no bare ends* of pipe protruding to cause turbulence.
8. **Well Designed Entrance Pan** keeps out dirt, speeds up assembly, stabilizes line.

Send for a **FREE** copy of "The Irrigation Equipment News!"

IRRIGATION EQUIPMENT COMPANY, INC.

409 East 8th St., Eugene, Oregon

another SACCO-FED CHAMPION!

GRAND CHAMPION STEER (Jr. Div.). Shown by Bonnie Lu Logan, Lin-Lo Farm, VanWert, Ohio, at the 1949 International Livestock Exposition.

Brought Up on SACCO—the BIG-VALUE Mineral

Both Bonnie Lu Logan and her father, R. G. Logan, know there's something better in Sacco. They write: "We use Sacco V-19 Mineral in our feeding program throughout the year. Have found it very satisfactory." Bonnie Lu's success proves the extra quality in Sacco makes a big difference—assures best protection against mineral deficiencies that constantly threaten livestock profits. Sacco V-19 Mineral is complete, balanced, scientifically blended. To every pound of Sacco, 24,000 units of Vitamin D are added. Safeguard *your* farm animals . . . with Sacco! Write today for free literature and the name of your Sacco V-19 dealer.

SACCO — ESTABLISHED 1894 — TRADE MARK REGISTERED

THE SMITH AGRICULTURAL CHEMICAL CO.

Plants at Columbus, Ohio; Indianapolis, Ind.; Saginaw, Mich.; Holland, Mich.; Carey, Ohio.

V-19 MINERAL FEED

"MOTO-MOWER"
best known name in power-lawn-mowers
for thirty-one years
24" Comm. Mower
22" Scout
20" Moto-Boy
18" Boy
"M" Pup Cut
other models up to 7!
There's one to fit every pocketbook
$79.95 power cut f.o.b. factory
for every size LAWN
- and anyone in the family can use it!
Write for literature and name of nearest dealer
The MOTO-MOWER Company
4618 Woodward DETROIT 1

20 issues of Farm Quarterly

$7.75

The next twenty issues of Farm Quarterly are available at less than 40 cents a copy. Just order a 5 year subscription. attach your check for $7.75 and yours will be the pleasure of receiving the next 20 issues of the beautiful. informative Farm Quarterly.

Farm Quarterly
22 East 12th St.. Cincinnati. Ohio

Enter my 5 year subscription for which I enclose $7.75. My subscription is

- ☐ new
- ☐ renewal
- ☐ extension

Name.....

Address.....

City or R.F.D.....State.....

They can't be fed by the "by guess and by gosh" method.

It is important to know just what part vitamins play in the nutrition of farm animals. A book as long as *Gone With The Wind* could be written on the action and interaction of vitamins in the animal body. Briefly, vitamins play an important role in the prevention of various deficiency ailments connected with growth. health and reproduction. In any case, vitamins are needed in only minute amounts, but the importance of having these minute amounts present cannot be over-emphasized.

There are several of the known vitamins which are often deficient in the usual livestock and poultry rations. One of these is vitamin A. This vitamin aids in growth promotion, so is important in the ration of young animals. It is important that all young animals take the first milk their mothers produce (colostrum) inasmuch as this milk is very high in vitamin A (perhaps 10 to 100 times more than ordinary milk). This increased vitamin A content of the first milk is just another example of Mother Nature's way of looking after her children. Young animals have very little vitamin A stored in their bodies at birth so this colostrum intake is needed to increase their resistance to infection. Common sources of vitamin A are fish liver oils, green pasture and a green cured hay. For some reason feedstuffs carrying a yellow color are good sources of this vitamin: therefore, it is found in yellow corn but not in white corn. One of the reasons it is usually necessary to add vitamin A to rations is because most of the natural carriers lose their vitamin A potency after being in storage for a time. Animals on green pasture should have no vitamin A deficiency.

Vitamin D. or what is commonly spoken of as the sunshine vitamin. is frequently deficient in many rations. Vitamin D plays a very important part in the development of sound bones. One of the many symptoms of vitamin D deficiency is rickets. a bone ailment. This vitamin is present in fish oils. irradiated products, sun cured hays. and is produced by body processes when exposed to sunshine. Animals out of doors during the summer months are usually well supplied with vitamin D. During the winter months the problem of keeping the Vitamin D level where it should be is somewhat more difficult. Today, with the use of oils and irradiated products in feeds. animals can be raised if necessary in the complete absence of sunlight and still show no vitamin D deficiency symptoms.

Vitamin G. now known as riboflavin, is especially important in poultry and hog rations. This factor promotes good growth. aids in egg production and the prevention of dermatitis. It is present in liver, milk, whey and high quality alfalfa. For years tons and tons of the by-products of the distilling industry were dumped into rivers as

Kelly's DWARF FRUIT TREES

★ CONSERVE SPACE ★ PRODUCE FULL SIZE, TOP QUALITY FRUIT ★ USUALLY BEAR SECOND YEAR AFTER PLANTING

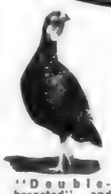
VARIETIES – APPLES: Cortland, Red Delicious, McIntosh
PEARS: Bartlett, Clapp's Favorite, Duchess

PRICES – $3.75 each, 3 for $10.50, 10 trees $3.00 each; 100 trees $2.50 each.

Write for our BIG FREE 1950 CATALOG in full color. Describes and illustrates best varieties of Apples, Pears, Peaches, Cherries, Blueberries, Strawberries, Raspberries, Grapes, Roses, Shrubs, Ornamental and Shade Trees. Satisfaction Guaranteed. Established 1880.

KELLY BROTHERS NURSERIES, INC.
242 Maple Street, Dansville, N. Y.

Lan-Tay Breeds The Ideal "Family-Size" Turkey



Dressed weights for our *Medium* Broadbreast Bronze hens are 11-13 lbs., toms 18-20 lbs. Dressed weights of our *Small* Broadbreast hens are 8-11 lbs., toms 14-17 lbs. Bred to size for 10 years. U. S. Approved — Pullorum Clean. 100% live delivery of poults guaranteed. Big demand. Order now.

"Double-breasted" and bred for fine bone structure.

LAN-TAY TURKEY FARM
BOX F ANCHORAGE, KY.

Here's your best new buy in garden tractors! The new low-priced Model 12BB POWER-HO DeLuxe. Streamlined, with new high power 2½ H.P. engine and many exclusive "extras" including new 5-12 tires on 4" rims. Takes all standard Bolens implements. See it, try it, at your dealer, or write for details. IT'S GREAT!

BOLENS PRODUCTS DIVISION
Food Machinery and Chemical Corp.
Better performance, better price... your best buy is BOLENS
316-1 Park Street • Port Washington, Wis.

a means of getting rid of what was then considered refuse. Today the supplies of this very same product are widely used in the nutrition of animals and poultry because of the high vitamin potency. Distiller's products and "riboflavin supplement" are commonly used to supply this vitamin.

Niacin, or nicotinic acid, is a vitamin that is added to most hog rations and in some instances to the rations of turkeys and broilers. This vitamin promotes health and vigor. Pigs deficient in niacin may have poor appetites, dermatitis, and be generally unthrifty.

Poultry deficient in niacin may develop sore mouths, show a marked reduction in feed intake, develop a scaly dermatitis and be generally unthrifty. The best natural sources of this vitamin are wheat middlings, wheat bran, liver meal, and dried yeasts.

Other vitamins just as important as the four listed above do not present a nutrition problem to the farmer because they are normally carried in sufficient quantities in the regular feedstuffs he will be giving his animals every day. Below are listed the other vitamins and their function in nutrition. Pantothenic acid, or the filtrate factor ,promotes good health and vigor. Vitamin B_1, or thiamin, promotes a healthy nervous system. Vitamin C, or ascorbic acid, prevents scurvy (is not needed by poultry). Vitamin E, or the reproduction vitamin, is probably connected with reproduction and the maternal instinct. Vitamin K, or the coagulation vitamin, aids blood clotting. Vitamin H, or biotin, aids growth, food utilization and feathering. Choline works in conjunction with manganese to prevent perosis.

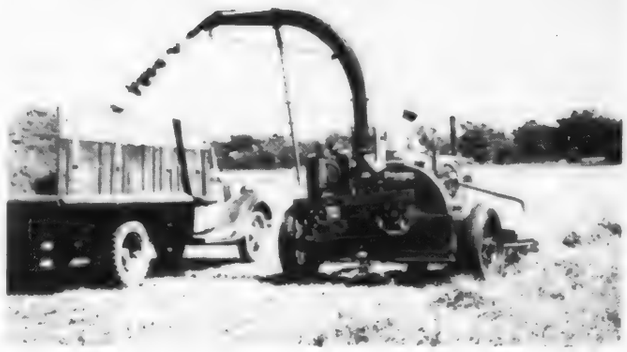
Recently isolated vitamins are inositol, pyracine, folic acid, para amino benzoic acid, and B_{12}.

Water—Free and Plentiful

Of the six basic food nutrients only one comes to the farmer free of charge. This is water. The fact that water is free has led many farmers to underestimate its great importance in nutrition. Of all the animal foods, it is the most important because: (1) An animal will die more quickly from lack of water than from any of the other food nutrients. (2) Water carries the other five nutrients from one part of the body to another. (3) Water aids digestion through chemical reaction. (4) Water aids in the control of bodily temperature.

In spite of this weight of evidence *WATER IS THE NUTRIENT WHICH FARM ANIMALS ARE MOST OFTEN DEPRIVED OF,* and this in spite of the fact that it's free. There may be a psychological reason back of this. Perhaps the farmer says to himself, "I had better feed this bag of commercial feed carefully, it cost me plenty." And then he turns around and walks from the hen house or pig lot leaving a dry watering trough behind him. Every feeder should realize that there is

Best Way to Handle Hay...



Handles both hay and row crops... Quickly and easily changed over from one crop to another... Eliminates all the heavy work ... Only clean, twine-free feed goes into silo ... Savings on twine alone frequently offset the extra investment ... Model 151D (with engine or power take-off) for the average farm ... Model 181 for farms where maximum capacity is needed.

See your Papec dealer or send us your name for free booklet describing all models of Papec Forage Harvesters. Papec Machine Company, 11 Main Street, Shortsville, N. Y.

★ PAPEC ★

FORAGE HARVESTERS

PAPEC Feed Machinery also includes Hay Chopper-Silo Fillers... Crop Blowers...Ensilage Cutters...Hammer Mills...Feed Mixers

SHOWERS TO Order

NO CLOUDS REQUIRED WITH

RAIN BIRD Sprinklers

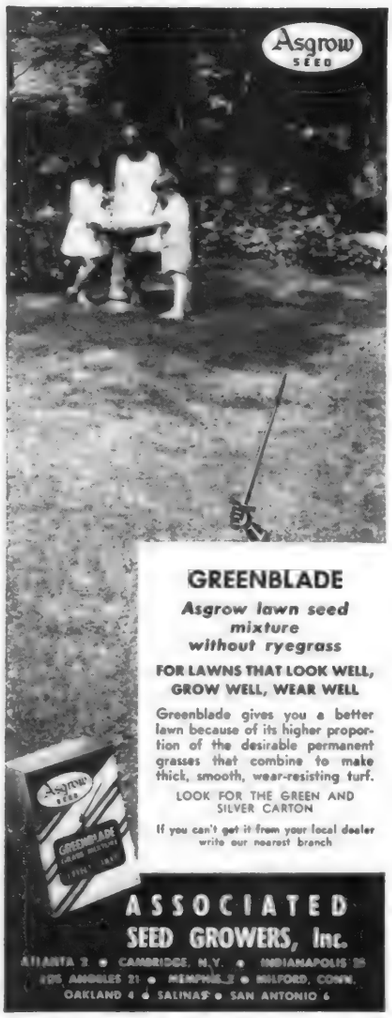
Be independent of the weather—provide *the necessary amount* of water for your crops *when and where* needed. Faultless operation of Rain Bird Sprinklers assures increased production at lower costs on row crops, pasture, orchard or garden.

Specially Designed... Used throughout the world, Rain Bird supplies 19 different types of sprinklers for agricultural purposes alone. Solve your irrigation problem with the most appropriate sprinkler for your particular needs.

Write for free catalog on the world's most complete line of agricultural sprinklers

L. R. NELSON MFG. CO.
PEORIA, ILLINOIS

RAIN BIRD
SPRINKLER MFG. CORP.
Glendora, California


Asgrow
SEED
GREENBLADE
Asgrow lawn seed mixture without ryegrass
FOR LAWNS THAT LOOK WELL, GROW WELL, WEAR WELL
Greenblade gives you a better lawn because of its higher proportion of the desirable permanent grasses that combine to make thick, smooth, wear-resisting turf.
LOOK FOR THE GREEN AND SILVER CARTON
If you can't get it from your local dealer write our nearest branch
ASSOCIATED
SEED GROWERS, Inc.
ATLANTA 2 • CAMBRIDGE, N.Y. • INDIANAPOLIS 25
LOS ANGELES 21 • MEMPHIS 3 • MILFORD, CONN.
OAKLAND 4 • SALINAS • SAN ANTONIO 6

GRAVELY
TRACTOR
POWER
for your
SMALL
FARM
Are you a slave to the drudgery of your small farm? Free yourself with GRAVELY Power Equipment. POWER does the work, gives you bigger, better crops, more beautiful grounds about your home, with less work! . . . The GRAVELY Plows (ready-to-plant seedbed in one operation); Mows hay, weeds, brush, lawns; Cultivates; Hauls; Saws; Sprays. Power to spare with big 5-HP Engine. Two speeds forward & REVERSE.
All gear-driven, will last a lifetime! World's finest for 28 years.
FREE!
Power Drudgery
Mail coupon for name of dealer and this big two-color Free Booklet — "POWER VS. DRUDGERY" — that tells you how to put POWER to work on YOUR small farm — how to enjoy your country living without long hours, hard work!
MAIL TODAY
GRAVELY MOTOR PLOW & CULTIVATOR CO.
BOX 332 DUNBAR, W. VA.
NAME
ADDRESS
TOWN STATE

no ingredient or combination of ingredients that will do the job he wants done, regardless of the price paid, unless fresh clean water is kept before the livestock in plentiful supply at all times.

The Amazing B_{12}

The most amazing and interesting of all is B_{12}, which has set nutritionists agog. Handsome claims are made for it and some feed makers are having a holiday in promoting it. This vitamin, which is part of the so-called "animal protein factor," is said to have many revolutionary possibilities.

For years farmers have known that hogs following cattle grow better than similar hogs kept in lots apart from the cattle even though the two groups of hogs were on exactly the same ration. The usual explanation was that the pigs following the cattle had access to large quantities of partially digested corn and, therefore, were able to make better than average use of it. This theory is entirely without grounds since the whole corn which passes through cattle is in no way partially digested. All that can be said of such corn is that, being thoroughly moistened, it is easier to chew.

Some feed experts suggested that perhaps protein entered into the picture in some way. On the basis of this the term Animal Protein Factor was born. This term still has a prominent place in the language of livestock nutrition.

Nutritional research with swine some years ago turned up the fact that pigs, in order to grow and develop at an optimum rate, need the B-complex or water soluble vitamins. About this same time it was found that cow manure, or manure from any ruminating animal, contains a very goodly supply of these vitamins. Once these facts were established, the answer to the fast gains made by hogs following cattle was at hand. When rations fed to steers are analyzed for the water soluble vitamins and then the droppings from these same animals are analyzed, it is found that the vitamin content of the manure is higher than that of the ration fed. This increase of necessity must come from some place. It is known today that the action of the millions of microorganisms in the first stomach compartment (paunch or rumen) of ruminating animals produces these vitamins directly within the animal itself. These vitamins are in turn deposited in the manure, giving it considerable nutritive value.

As soon as the vitamin idea was established and proven, it then became known that the long standing Animal Protein Factor idea was false. Even though this is true, the term stays with us because it has been so well established.

In April, 1948, another step forward was made in solving the Animal Protein Factor riddle. Merck and Co., manufacturing chemists of Rahway, N. J., isolated a red crystallin material which they called Vitamin B_{12}. Thus after long years of search, research, and guess, the actual entity responsible for stepped up growth rate of pigs under steers was pinned down. Upon the announcement of this discovery the great flurry that is still with us regarding vitamin B_{12} and its miraculous powers was started.

Vitamin B_{12}, which is one of several factors making up its predecessor, the Animal Protein Factor, is without doubt of great importance in the field of nutrition, both human and animal. If nothing more ever came from the isolation of this vitamin than the ability to cure people of that dreaded disease, pernicious anemia, all efforts would be more than repaid. This vitamin is proving of value far beyond this single use, however.

Vitamin B_{12} is a mighty midget. One ounce of the pure crystal is sufficient to supply the needs of 56 million baby chicks for one week. On this basis one ounce of the pure material would sufficiently fortify 70 carloads of chick starter. The use of the pure crystal at present is confined to laboratory investigations because of its extremely high cost.

In livestock feeding this vitamin is important because, as was demonstrated by feed lot pigs, the vitamin promotes health, vigor and rapid growth. The fact that this vitamin has just recently been discovered and is now being highly publicized does not mean that something new under the sun has been discovered. This now famous B_{12} has been with us since the beginning of time. Man has just now been able to pin it down. As someone remarked recently, nutritionists are just now finding out what hogs have known for a long time.

The fact that chicken and cattle manure have been the source of most publicity as the location of B_{12} does not mean that these are the only places it is found. Farmers and feeders have had available to them natural carriers of this vitamin for years. Fish meal, meat scraps, and the more recent homogenized condensed fish, are what are known as natural carriers of this nutrient. The only blind spot in the use of natural carriers is the fact that only by laboratory assay methods or quality testing can the potency of these natural carriers be measured. Natural sources may vary from a high to a very low amount of the vitamin. Only by laboratory analysis can the actual quality be determined. Today many feed manufacturers are adding what is called Animal Protein Factor supplement to their feeds in addition to the natural carriers. This is not done as a substitute measure for the natural carriers. Instead it is done as a reinforcement of the natural carriers in order to standardize the feed, thus making for greater uniformity and a maximum of nutritional goodness. The old standbys like tankage, fish meal and meat scraps do far more for a ration

than furnish B_{12}. As important as this new discovery is, it still is in no way a substitute for the other water soluble vitamins (of which there are many) or the all-important amino acids (building stones).

Vitamin B_{12} is just another cog in the wheel of sound nutrition, and is in no way a lone crusader that can replace all contenders for the limelight on the livestock feeding stage. This erroneous idea has gained wide acceptance because of half truths which have been given wide publicity. A good example of this was a statement appearing recently to the effect that man would soon be nourishing himself completely and soundly by eating dry cereal three times a day sprinkled with Vitamin B_{12}. It is a little difficult to imagine such a menu replacing a thick juicy steak now and then, which it won't.

THE AUTHOR—Robert Zinn is a swine specialist whose livestock articles have appeared in *Farm Quarterly* many times. After high school, he farmed for three years before entering the College of Agriculture at the University of Illinois. He then spent seven years as an instructor in vocational agriculture, and went from that to his present position as Swine Specialist for a large feed manufacturer.

HOG DOG

(Continued from page 77)

trained dogs is about the same as the value Doc Pugh placed on the saddle horse he swapped for Burt.

Blue Leopard dogs can be just as easily trained to handle cattle, horses and sheep as they can be taught the skillful management of wild hogs. Breeders in Texas, Tennessee and Kentucky, notwithstanding the 18th verse of 23 Deuteronomy, are selling a lot of dogs.

Viewed from broadside this graceful animal presents an unusual appearance. His dark leopard spots against a blue or tawny background present a coloring that is different from that of any other canine. When he turns his head, disclosing his white eyes, the overall picture is weird and uncanny. Even so, he is a beautiful dog with a strong, graceful body, heavy shoulders, broad chest, rather long but powerful neck. His collar and chest are white; his legs, large but well-formed, are either blue or tawny, fading into snow white below his knees. Burt, Doc Pugh's bitch, weighed 62 pounds the day her seven puppies were two weeks old. The males are somewhat heavier.

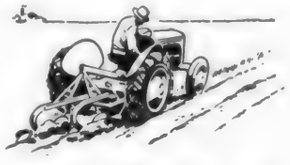
Origin of the Breed

Where did such a breed of dogs come from? What is their origin? Who first brought them to Louisiana? To what other breed can their bloodlines be traced? No one knows.

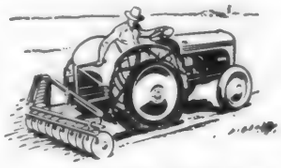
Not one of the five scribes who came with Hernando DeSoto's gold hunters left a description of the dogs they brought along, except that they were vicious, man-hating animals. But those chroniclers did leave records which disclose that the Spanish commander, on several occasions unleashed his dogs and permitted them to tear live humans into shreds, only for the purpose of intimidating the horror-stricken Indians. History informs us that after the death of DeSoto, the Spanish explorers, under the command of Moscoso, lived a short distance from a lake the Indians later called Catahoula; that during the winter of 1540-1541, these adventurers built and launched vessels that were to take them to what is now Mexico and that at some point south of the site of present Natchez and north of where Baton Rouge now stands, the Spaniards unloaded their horses and dogs to give them water and exercise. Hostile Indians had been following this fleet of crude vessels, hoping, waiting and watching for an opportunity to attack.

As soon as the vessels were tied to trees along the bank, the Indian warriors charged, stampeding the horses, permitting eight of them to escape into the forests. The dogs had been unleashed to help the Spaniards resist the attack and several of them were captured by the Indians.

SAVE TIME WITH WEED FARM TRACTOR CHAINS

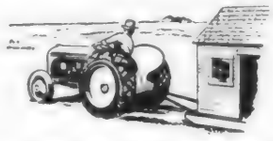


No costly waiting after rain to plow, cultivate or harvest. Save hours, even days, with WEED tractor chains.



Weed tractor chains keep your rubber tired tractors rolling when ground is too wet to work without them.

Farm tractors equipped with WEED tractor chains will not spin or side-slip in mud or gumbo.

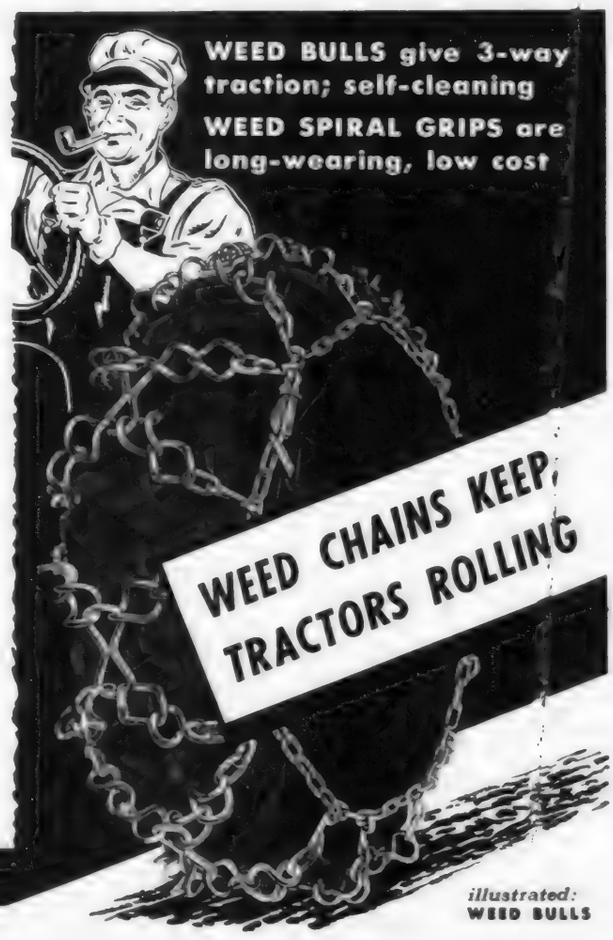


Right and left hand twist retards tightening up; no adjusting; easy to put on and take off—a one man job.

See or call your implement dealer and order your WEED TRACTOR CHAINS now

ACCO York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE


WEED BULLS give 3-way traction; self-cleaning
WEED SPIRAL GRIPS are long-wearing, low cost
WEED CHAINS KEEP TRACTORS ROLLING

illustrated: WEED BULLS

Best under the sun—

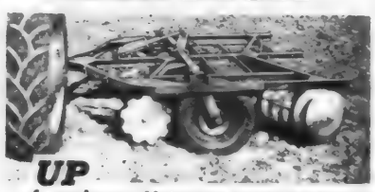
SUNBEAM CHICKS

Be sure of getting husky, vigorous chicks that mature raidly into profitable egg and meat producers — order from SUNBEAM. Ohio - U. S. Approved Pullorum Controlled Hatchery with a record of over 3 generations of hatchey ownership and management. 17 breeds, sexed chicks available. 100% live delivery, 98% livability guaranteed. Order the "Best Under the Sun"—SUNBEAM!

FREE CATALOG—*Big, colorful, interesting: Reasons why Sunbeam Chicks are a wise investment. 1950 price list included. Write for your copy today.*

SUNBEAM HATCHERY
BOX 40, FINDLAY, OHIO

It's The Smalley HYDRAULIC RAM DISK



UP for sharp U-turns or transport

DOWN for deep-cut disking

It lifts, it lowers, it cuts *deep*, it's controlled by a hydraulic ram. Rugged and powerful as a bighorn ram, this new disk is the dream of the tractor farmer. Extra heavy notched disks cut stalks, orchard or pasture sod.

Permanent angle, tandem disks in a heavy-girder frame pulverize completely at any depth you select, from one inch to hub-deep. Enclosed air-tired wheels permit disking close to fence and trees.

Touch the quick power lift to adjust depth, turn, cross waterways or travel on the road. It's more than just another disk — it's the RAM DISK.

WRITE Smalley Mfg. Co.
587 YORK STREET, MANITOWOC, WISCONSIN

These dogs may have been the ancestors of the Catahoula dogs.

In 1682, five years after he had descended the Mississippi with LaSalle, Tonti-the-Iron-Hand trekked cross-country to visit the Natchitoches Indians, being accompanied by scouts from the Taensas tribe. In brief notes he told of seeing a number of dogs with white eyes and mottled spots.

Father Athanase was the most prolific chronicler of the group, calling attention in his notes to the magnificent oaks along the streams, referring to the long-stemmed pines farther inland. From his recording it is impossible to determine whether the strange dogs he saw belonged to the Natchitoches or the Taensas Indians. He merely mentions the fact that they saw strange dogs with white eyes and mottled spots.

In 1802 Rezin Bowie and his brother, Big Jim, owned a pair of Leopard dogs. One can well imagine those two glass-eyed animals haunched at the feet of Rezin the night he designed the famous Bowie knife, its counterpart subsequently to be wielded with deadly purpose by Big Jim before he was killed at the Alamo. The Bowie farm was not far from Catahoula Lake and these two famous fighting men butchered many a wild hog in the surrounding swamps.

And still this does not answer the question, "Where did the Catahoula dogs come from?"

Will Nugent, an aged swamp man who has owned Catahoula dogs all his life, says, "Indians had them before the white man ever come to this country; they've always been here."

Only within the past half-century has this breed scattered to other sections of the State: a few have been taken to neighboring states, Kentucky, and Texas.

Forty years ago Will Nugent and his father followed a drove of 400 hogs along the road to Alexandria. Two Blue Leopard dogs handled the herd for four days and nights without losing one of them.

Wild hogs may never again inhabit the swamps in great numbers, but thousands of Brahman cattle are produced each year in the Delta sections and Blue Leopard dogs are needed to handle them. And yet, cattlemen and herdsmen are worried. How can they go into the Catahoula area and buy dogs when "the Bible speaks agin it?"

There is no doubt about it. The 18th verse of 23 Deuteronomy has kept stock growers of America from learning about one of our finest breeds of working dogs.

THE AUTHOR—Sam Mims has a knack for searching out unusual and interesting stories within his home state of Louisiana. In the autumn 1949 issue of *Farm Quarterly* he told the story of Spanish Moss. He grew up among the people of the bayous and has been, in turn, a lawyer, soldier, and government information specialist. From his home in Atlanta he contributes articles and stories to many national magazines. He has also written a number of books including the widely read, Chenault of the Flying Tigers.

DWARF FRUIT TREES

More PREMIUM QUALITY FULL-SIZED FRUIT
Easier-to-care-for trees

Whether you want larger yields per acre — harvests commanding highest market prices—or luscious fruit for your own table, Dwarf Fruit Trees are more profitable stocks for you.

Early bearing at 2 to 3 years of age (up to 6 years sooner than standard-sized trees); easier to prune, spray or pick; no expensive power equipment; greatly reduced maintenance costs.

WRITE TODAY for our catalog. Complete instructions in the care of many choice varieties of Apples, Peaches, Pears, Plums and other size-controlled stocks. Apples grafted on true East Malling rootstocks, Nos. I to IX, to meet special needs.

Also learn about ESPALIERS (TRAINED FRUIT TREES)—decorative, fruitful, ideal for trellis, wall or hedge. Our catalog will show you just how our proven stocks of these modern trees can bring you greater profits.

WRITE TODAY FOR FREE CATALOG F-1

The What, When, Where & How to in the Planting & Care of Dwarf & Trained Fruit Trees

HENRY LEUTHARDT
Port Chester • New York
King Street opp. Comly Avenue

LEARN CHICK SEXING!

EARN $4.00 TO $12.00 PER HOUR
G. I. APPROVED
CONTINUOUS CLASSES

Learn chick and turkey sexing, also caponizing and culling. Great demand for experts, both men and women. Graduates now in England, France, Cuba, Canada, Puerto Rico, Mexico, as well as 27 States. Our 11th year. Write for details.

PILCH POULTRY SCHOOL
BOX SF, THOMPSONVILLE, CONN.

DIAMOND IRON REMOVAL FILTER

Removes iron and other foreign matter which makes water discolored or cloudy. Leaves it crystal-clear and palatable. Moderate cost. Write for free booklet giving full information.

OSHKOSH FILTER & SOFTENER CO.
Oshkosh, Wis.

MORE MONEY IN $HORTHORNS

For Breeding—For Feeding

America's oldest and most profitable breed of cattle offer greater size, fastest gains, quiet, easy-handling dispositions and widest adaptability. Check modern Shorthorn performance records including carlot and single steer Grand Championships OVER ALL BREEDS. Write us for illustrated literature and lists of member-breeders who can supply you with seed stock.

AMERICAN SHORTHORN BREEDERS' ASSOCIATION
Dept. FQ, Stock Yards, Chicago 9, Ill.

BREEDS OF SHEEP

(Continued from page 81)

nant mutton breed in the West and some parts of the East. The breed is comparatively new. Youatt said in 1837 that the sheep of Hampshire were largely Southdown or Southdown-Berkshire crosses. The Berkshire is now extinct.

Here again the Southdown Leicester, through Cotswold blood, appears as the dominant factors for improvement. The Hampshire is one of our largest breeds, a bold fronted, heavy boned sheep which puts on weight rapidly. The color of the face is black. The ears are large, and there is a slight fringe of wool below the eyes. They have long deep bodies and a lightweight fleece. Crossbred Hampshire-Rambouillet ewes, or Hampshire-Corriedale, or Columbia ewes, are very popular for mothers of market lambs in Kentucky, Virginia, Tennessee and some other states. (See Farm Quarterly Winter 1948). The favorite sire is the Southdown.

Suffolk. A recent rival of the Hampshire is the Suffolk, another British breed. The modern Suffolk was produced through crossing the original Norfolk and Suffolk sheep with Southdown rams. The old Norfolk breed was horned, had black or mottled face and legs, narrow chest and wide loins. This breed was one of the first brought into the United States and there is some belief that the mountain sheep or the Appalachians are descended from them.

The modern Suffolk, like the Hampshire, is a rapid growing sheep about the same size as the Hampshire but differing in head type. The head is black and bare of wool to back of the ears, the head is lighter than that of the Hampshire, a point its breeders point out as in its favor. The lambs of both breeds are ready for market at an early age and preferably should go at weaning time. Suffolks are the leading breed in Canada and are becoming quite popular in the United States.

Oxfords. This breed originated through crossing of Hampshire ewes with Cotswold or Southdown rams. The breed owes its popularity to its size and heavy fleece of wool. The modern Oxford compares in size with the Hampshire and Suffolk and the lambs make a similar rapid growth. The face is light to grayish brown; the fleece weighs about 10 pounds, although there seems to be a tendency toward lighter fleece weights in recent years. The breed is most popular in Michigan and Indiana, although good flocks are to be found in other states.

Dorset. A native of Dorsetshire, this white faced breed has long been noted for its early lambing tendency. Both sexes are horned. Its origin is in some dispute. Some claim it evolved through selections within the original breed; others say Southdown and Merino blood was used. That Merino blood could have been used seems likely since both breeds are white faced and horned. Both breed at all

WOODEN FENCES & GATES
WOVEN PICKET FENCE
Half-round saplings. 2 types. Woven Cleft with ¼" between pickets. Our special Close Type has pickets with sawed edges butted tight together; assuring absolute privacy. We also import genuine French picket fence.
POST AND RAIL FENCE
A strong, beautiful, long-lasting all-purpose fence. Made of finest selected, hand-split chestnut-timber. Available in the 2, 3 or 4 rail types. As with all Rusticraft Fences, matching gates of many widths available.
ENGLISH HURDLE FENCE
Ideal for property lines. Gives protection from trespassing. Two heights 3 ft. and 3 ft. 8 in. Closely spaced lower rails protect shrubs, keep dogs off or within property. Shipped in 8 foot sections, ready to erect.
"E-Z-OPN" HORSEBACK GATE
With the new, improved solid-bronze "Hi-Handle" you can open gate while sitting erect and solidly mounted. Gate closes and locks automatically with slight push from either side. In widths from 4 to 12 ft.
WE ARE THE ONLY FENCE COMPANY IMPORTING
FRENCH WOVEN PICKET FENCE DIRECT FROM FRANCE
Write today for Illustrated Booklet and Prices.
Rusticraft FENCE CO.

MOTHER NATURE IS FICKLE..
Gorman-Rupp
Irrigation Pumps Are Not
They Never Fail to Deliver
When rains fail, crops fail. A Gorman-Rupp Irrigation Pump assures WATER WHEN NEEDED with least fuel expenditure.
Gorman-Rupp pumps run day after day, entirely trouble-free.
Available in various sizes—ratings from 100 GPM at 70 lbs. pressure to 1100 GPM at 130 lbs. or 3000 GPM at 20 lbs.* They will give the best performance for the least cost of installation, operation and maintenance. A dependable pump.
Write for Irrigation Bulletin 9-IR-11
HANDY PUMP
Weighs only 20 pounds . . . delivers 8 GPM at 40 lbs. pressure (more at lower lifts) . . . lifts up to 25 ft. Electric motor driven. An all around pump for farm and home use.
Made in Various Sizes. G.P.M. varies with pounds pressure, continuous operation ranges follow. (Maximum performance approximately 15% greater.)
Model HP Capacity-Pressure Range
6201 7 80 gpm @ 75 lbs. — 150 gpm @ 40 lbs.
5306 11 150 " @ 65 " — 300 " @ 35 "
5303 20 225 " @ 85 " — 400 " @ 40 "
5410 40 300 " @ 75 " — 600 " @ 50 "
5404 50 550 " @ 120 " — 775 " @ 75 "
5503 75 625 " @ 120 " —1250 " @ 60 "
5507 90 800 " @ 120 " —1400 " @ 60 "
5" Fig.
701 125 1100 " @ 130 " —1400 " @ 110 "
*61001 40 1200 " @ 55 ft. —3000 " @ 35 ft.
*Low pressure, big capacity for open ditch irrigation.
THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

When buying sprinklers investigate . . .

SKINNER

"the Quality line"

A complete range of agricultural sprinklers—from 3 GPM to 410 GPM. Skinner agricultural sprinklers are sturdy and compact, made from accurately machined brass, bronze and stainless steel parts. Write for literature and name of nearest distributor of Skinner sprinklers.

The Skinner Irrigation Co.
200 Water St., Troy, Ohio

SKINNER SYSTEM OF IRRIGATION

FREE— Irrigation planning service

Our engineers are experienced in planning overhead irrigation systems to give maximum results for each dollar invested. That's why leading midwest farms use Oldfield engineered systems. This service is free—No obligation—Send us a sketch of your fields, indicating size, crops, source of water, and power available.

We represent and stock:

- GORMAN-RUPP PUMPS
- SKINNER SPRINKLERS
- ALUMINUM PORTABLE PIPE
- McDOWELL COUPLINGS

Immediate Delivery from Stock

Why wait for rain—irrigate now

OLDFIELD EQUIPMENT CO.
CINCINNATI, OHIO
4935 Paddock Rd. JE. 1474

seasons of the year, and it is known that Dorset fleeces doubled in weight shortly after Merinos were brought into Dorsetshire.

The Dorset has occupied a prominent position in American sheep husbandry for the production of early or "hot house" lambs. These lambs come on the market at a season when no other lambs are available and command a premium price. The development of an early lamb in California has reduced the former wide spread in price, but "Easter lambs" still are in demand and the Dorset or Dorset-Delaine ewe admirably fills the bill.

The Dorset is medium in size, has a good mutton carcass, is a heavy milker and is hardy. In recent years breeders have made many improvements in correcting weak pasterns and rough backs.

Ryeland. In the valley of the Rye River in Herfordshire is found a white faced breed whose origin is not definitely known. Some say the breed is of Merino blood brought in by the Romans. Later Leicester crosses were made to improve the carcass, and the breed, while slightly larger, has been called "The white faced Southdown." It is quite popular in England but only a few flocks have been brought into the United States. The breed has not proven hardy here.

Long Wool Breeds

Two of the long wool breeds, the Lincoln and Cotswold, have had some popularity in this country. Another, not strictly long wool, however, is the Romney.

Lincoln and Cotswold. While some 11 different breeds of long wool sheep are to be found in England, only the ones mentioned above have become common here. While both are quite similar in appearance, and both carry fleeces of wool from six to ten inches in length, heavy in weight and braid, their native environment was quite different.

The Lincoln comes from a marshland area while the Cotswold is a hill breed. Both breeds were improved by using Leicester rams. The principal function of these breeds today is for crossbreeding, particularly on ewes of fine wool blood.

Romney. This breed is also a marshland breed found in Kent. The breed seems practically immune to foot rot and liver fluke and is well adapted to localities where the vegetation is rank or the climate moist.

In the North Island of New Zealand, Romneys prodominate and the crossbred Lincoln-Romney ewe is a favorite for mating to Southdown rams. Improvement in the Romney came about through the use of Leicester blood. Romneys are fairly large in size, of good mutton type and they carry a fairly heavy fleece. There is a tendency to hairiness on the brisket which careful breeders are eliminating.

Newer Breeds

About 100 years ago many experiments were carried out in crossing rams of long

FARMING for Profit

OPEKASIT

Reg. U. S. Pat. Off.

OPEKASIT can show profits for farm owners. Complete management service with especially trained personnel and proved methods.

PROVED

For all types of farm operations. DIRECT and CONSULTATION MANAGEMENT—TENANT SUPERVISION—Farm Planning and Budgeting. AGRICULTURAL ENGINEERING—Building and Drainage Planning and Design. CONTRACT FARMING—Building Construction and Maintenance. Ditching and Tiling. ARTIFICIAL INSEMINATION of Dairy Cattle.

WRITE FOR DETAILS

OPEKASIT FARM MANAGEMENT
LEBANON, OHIO

(Other offices at Crawfordsville, Indiana, Hamilton, Ohio and So. Charleston, Ohio.)

IXL FROST PROOF HYDRANT

Will Assure You Running Water Regardless How Low the Temperature

Merely bury the supply to the greatest depth of possible frost and this hydrant can never freeze up. Thousands are rendering years of service on farms throughout the nation. So simplified even a child can repair. Only one flat washer on supply and backed by 58 years of manufacturing experience. No better frost proof hydrant on the market.

5 ft. overall size $10.95 f.o.b. Phila
Add for longer lengths 95c per ft.
Circular F-120 on request
For the man who demands the best.
Dealer Inquires Welcome

THE IXL PUMP & MFG. CO., INC.
959 North Ninth Street
PHILADELPHIA 23, PA.

Makers of Water Closets and Tank Fittings Since 1890

Where Better NEW HAMPSHIRES are Bred

Nedlar Farms
INCORPORATED
E. N. LARRABEE

The most thoroughly proved strain of New Hampshires in existence, also very popular with broiler growers. Backed by 25 years of pedigree breeding for both eggs and meat. Write for big, Silver Anniversary Catalog, Today.

A U.S. Pullorum Clean R.O.P. Breeding Farm

NEDLAR FARMS
Box Q PETERBOROUGH, N. H.

HASCO EAR TAGS

CATTLE SHEEP AND HOGS

No. 136

Used by U. S. Dept. of Agriculture, State Depts. and prominent breeders. Pliable, rust-resistant steel.

FREE SAMPLE

ORDER NOW!—PRICES INCLUDE NUMBERING!

No. 136 SALES TAG		EAR TAGS		
Quantity	Price	Quantity	Hog-Sheep	Cattle
100	$1.50	50	1.50	$1.60
500	6.00	100	2.50	2.80
1000	10.00	300	5.40	6.50

F.O.B. Newport, Ky. Applicator $1.65

Stamping name and address on any quantity ear tags, $1.50
BULL RINGS, CATTLE LEADS, ETC.—SEND FOR PRICES

National Band & Tag Co., Dept. 6-64, Newport, Ky.

MULTIFLORA ROSE FENCE

Full details and prices of this remarkable stock-tight fence in our big, colorful 1950 catalog. Also FRUIT TREES, BULBS, FLOWERS, EVERGREENS. All Guaranteed.

Write for FREE CATALOG

SPRINGHILL NURSERIES, Tipp City, Ohio, Dept. K-47

wool blood on fine wool ewes. One flock in England operated for over 20 years by using an original cross of Leicester rams on Merino ewes and inbreeding the offspring. The flock became famous for its quality but when the owner died no one carried on his work. It was not until some 25 years later in New Zealand that extensive crossbred operations by five or six breeders, and involving thousands of sheep, were undertaken. Both Lincoln and Leicester rams were used for the initial cross; then the intermediate type was selected and inbred. After careful selection and heavy culling for over 30 years, the type was sufficiently fixed to call the animals a breed. The name Corriedale was selected since it was at Corriedale that much of the original work was done.

Corriedale. This is a medium-sized animal of good carcass with a heavy fleece of high quality. It has inherited the constitution and flocking qualities of its dam, and the carcass of its sire. It is one of the most popular breeds in New Zealand and South America. It was recently introduced into the United States and is becoming popular here. The ewes are excellent mothers and feeders. Packers like the lambs for their feeding ability and the choice carcasses which they produce.

Columbia. The Columbia is a Lincoln-Rambouillet cross somewhat similar to the Corriedale. It is a slightly larger sheep but there is considerable variation in type both in fleece and carcass.

Romeldale. This sheep is produced by crossing with a Rambouillet ewe. It is found largely in California. The fleece runs finer than the Corriedale but in general appearance the two breeds are much the same.

Panama. The Panama is a reverse cross of Rambouillet rams on Lincoln ewes. This breed closely resembles the Merino. It is being bred to only a limited extent.

Polworth. This is an Australian sheep developed by crossing the crossbred Lincoln-Merino ewe back to a Merino ram. They may be polled or horned. There is considerable variation in form and fleece.

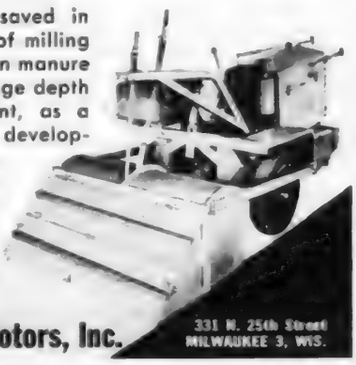
Targee. Under this name the United States Bureau of Animal Industry is attempting a somewhat similar breeding experiment. It is too early to tell whether the experiment is a success or failure. In France a cross of Leicester and Merino was made and the inbred crossbred was named Dishley Merino. Dishley is the locality where Bakewell developed the Leicester. Later an infusion of Southdown was made and the name changed to Ille de France. This breed is larger than the Southdown, has a heavier fleece, and a high quality carcass. If importing it were possible it should prove a great asset to the sheep husbandry of the United States. However, due to foot and mouth disease quarantine regulations, such a possibility seems remote.

One is impressed by the fact that all of the popular breeds in our country have been developed either through a long and

COMPLETE STORY
of Rotary Tillage in FREE BOOK, "Benefits of Rotary Tillage." Packed with pictures, facts, owner experiences. Tells how to till and SEED in one trip. Grass farming. Pasture renovation. Many other modern day applications. Send for it now.

TODAY, with the NEW Motorized Seaman Rotary Tiller, you select the right, most efficient tillage-rotor speed to produce the tilth (medium, fine or coarse)—exactly suited to each crop, each soil and even each soil condition on that particular day. The reason: a gear-shift, variable speed transmission for rotor speed control . . . Adjusted tilth is a secret of high yield farming. And with the SEAMAN you have it,—usually in one tractor trip.

Think of time and labor saved in faster, better tillage. Think of milling and mixing-in fertilizers, green manure uniformly through entire tillage depth . . . or by quick adjustment, as a mulch. Far greater humus development. Nutrients better placed, — more available for seedling and plant. Drought resistant growth. Greater yields. Erosion resistant, moisture holding soil structure.



Seaman Motors, Inc.
331 N. 25th Street
MILWAUKEE 3, WIS.

Balanced Bred— FOR RESULTS!

GOLDEN RULE CHICKS
with Special Early Order Discounts!

Balanced-bred for rich tender meat, for exceptional production of large eggs—that's GOLDEN RULE! Bloodlines introduced from the world's finest stock for 27 years assure you a profitable flock. An Ohio-U S. Approved Pullorum Controlled Hatchery—every chick scientifically hatched, personally handled, carefully packed. 100% live arrival guaranteed. 98% livability guaranteed, losses over 2% in 3 weeks replaced. Special discounts for orders placed now. Order your chicks from GOLDEN RULE—for results!

Pullorum-controlled, 18 breeds, 3 fine matings, early-order discounts, liberal guarantees, sensible prices . . . all shown in FREE CATALOG. Write for your copy now!

GOLDEN RULE HATCHERY
BOX 49, BUCYRUS, OHIO

Please send me your FREE catalog, 1950 price list, and discount information.

Name_____

Address or R.F.D._____

City_____ State_____

careful selection for certain qualities, as in the Merino and Rambouillet, or the use of one or more, and at times all three, of the foundation of Merino, Southdown or Leicester blood, followed by close inbreeding and heavy culling for several generations. Our present breeds of sheep are not the result of haphazard crossmating. Such animals may look attractive, but

until they are prepotent enough to breed true, they cannot be called a breed.

One More

Karakul. The Karakul is a fur-bearing sheep. This mountain bred animal from Bokhara is the source of various trade name furs such as Persian lamb, Astrakhan, Broadtail, and Karakul. The major income is from the pelts of the newborn lambs. For many years their exportation from their native Persia was forbidden.

Like many other fur farm ventures, some have made a success of raising Karakuls while others failed. Inferior breeding stock has been sold to inexperienced buyers at high prices; the expected $25.00 pelt often brought only $2.00 on the market. A few breeders of Karakul are showing a good profit. Aside from the pelt value the lamb is delicious and a fancy trade for it is within the bounds of possibility. The ewes are good milkers and the lambs make a very rapid growth. The wool from the adult sheep varies from black to gray and falls in carpet grade, since it is best suited for making rugs. The breed seems to do best in a cool dry climate.

Possibly no type of livestock breeding has demonstrated the possibility of modifying existing characteristics or creating new ones as has the development of the various breeds of sheep. Each was produced to meet certain needs or fancies. Some have remained localized while others have been widely distributed. For the farmer in any climate there is a good breed of sheep.

There is a breed for every need.

THE AUTHOR—J. F. Walkrer, who raises Corriedale sheep on his Gambier, Ohio, farm, organized the Ohio Wool Growers' Association in 1918 and managed it until 1927. He became interested in sheep because, as he says, "I had an intimate contact with a ram in my youth." Prior to his start in farming Walker followed, in quick succession, a variety of enterprises, including teaching school, selling school supplies, insurance, and borax. "In line with the times," he reports, "I have retired from active work and am now devoting only 12 to 16 hours a day to farm labor." This is his second article in *Farm Quarterly*.

HAY

Is what YOU make it TODAY

Now YOU Can Save Every Cutting
Increase Quality 2-4 Times

Artificial Hay curing by Peirson-Moore methods produces rich, leafy green hays, full of extra quantities of bone and flesh building nutrients . . . that are lost to sun and weather by ordinary field curing. Peirson-Moore cured hay is cut and safely in the barn the same day. **No more lost hay cuttings.**

Many users of our equipment say it paid for itself in one season. Our driers are easy and economical to operate. Large and small sizes. Present farm buildings can be inexpensively adapted for drying of hay, corn, small grains and other crops.

Fire Underwriters' Approved

Only Peirson-Moore Driers carry the famous Underwriters' Label of Approval . . . your guarantee that our driers are soundly constructed and safe from fire hazards. Write today for complete literature on hay drying.

PEIRSON-MOORE
LEXINGTON, KENTUCKY

1949 was a record year for

Corriedale Sheep

because both wool and mutton characteristics of this dual-purpose breed lead to maximum returns.

Corriedales return more dollars per head for wool than any other breed. Corriedale fat lambs top the market.

For free Booklet E and list of active members, write to:

Rollo E. Singleton, Secretary

American Corriedale Assn., Inc.
100 N. Garth Ave., Columbia, Missouri

WOODBINE FARMS

Corriedales

We have a fine selection of Ewes and Rams for 1950.
Write for flock history and prices.

J. F. & H. H. WALKER
Box 226, Gambier, Ohio

SQUAB BOOK FREE

Squab meat easily and cheaply raised for food. You get **POULTRY TOPS** for this poultry. Eaten or marketed **ONLY 25 days old.** Write today for **big free book, good** food starter, low prices, easy methods for profits, new sales opportunities, success accounts written by money-making breeders in every State.

OUR 49TH YEAR

RICE FARM
201 H. Street Melrose 76
Massachusetts

Dwarf
FRUIT TREES
BIG FRUIT—SMALL TREES
Useful and ornamental. Large size fresh fruit from your own backyard. A real **bargain.** Also Roses, Shade Trees, Evergreens, Shrubs. Write today for our big **FREE Color Catalog.**

New **FAIRLAND STRAWBERRY**
Where other varieties fail from diseases, **Fairland** makes money for you. Best for home gardeners too. Other Fruits, Evergreens, Roses. Write today for **FREE Color Catalog.**
EMLONG'S BOX 203
STEVENSVILLE, MICHIGAN

CRAYDEN'S CHICKS

26TH YEAR

breeding chicks with all the "extras": extra growth, extra fast feathering, extra egg output, extra meat quality, extra vigor.

The Business Man's Choice
For Business-Like Production

Crayden breeds for *consistent* quality that assures profits year in and year out. U. S. Approved—Pullorum Clean, Nine popular breeds, 3 crosses. Sexed or straight run. Ducklings also available. Descriptive new catalog — FREE. Write

CRAYDEN'S STERLING HATCHERY
Box F Ramsey, Indiana

Farm Management For 35 Years

Management and Services to Farm Owners Include:

Surveys — Reorganization
Budgets — Appraisals
Advisory — Accounting
Complete Management
Farm Income Tax Returns
Purebred Livestock on Commission

Burlingame, Field, Pierce & Browne, Inc.
45 West 45th Street, New York 19, N. Y., Luxemburg 2-1948
518 Turks Head Bldg., Providence, R. I., Gaspee 1-5116
Write or telephone for details and booklet

THE LIVING
FENCE
(ROSA MULTIFLORA)
Now, a colorful Hedge—a living stock-tight fence for your farm at 1/3 cost of wire fence. Also other big **bargains.** Write for your copy of our illustrated **FREE Color Catalog** today.

Plant BABY Evergreens
AND SAVE 40%
All popular varieties—grade No. 1—once transplanted. Real **bargains.** Also Shrubs, Roses, Shade Trees, Fruit Trees, Fruit Plants. Write today for big **FREE Color Catalog.**
EMLONG'S Box 202 Stevensville, Michigan

COUGHS DUE TO COLDS

among horses, mules, cattle, sheep and dogs call for treatment with SPOHN'S COMPOUND. A stimulating expectorant. Acts on throat and bronchial tubes to hasten relief. Used by world-famous horsemen for 55 years. At drug stores or direct, postage paid—70c and $1.40. Spohn Medical Co., Goshen, Ind.

SPOHN'S COMPOUND
FOR COUGHS DUE TO COLDS

THE GOOSE IS COMING BACK

(Continued from page 65)

mercial flocks, and hatcheries are supplying the goslings, the trend has reversed.

How He Started

Kollar got his start with geese when he purchased 500 goslings from Ohio State University in 1948. He speeded up his program in 1949 by purchasing 2000 goslings from the Norwalk Hatchery at Norwalk, Ohio, a leader in the production of goslings. During brooding he lost 175 goslings from the flock, which compared with chickens is not a high mortality rate. But it is higher than Kollar's mortality rate with ducks.

Wayne Alleshouse, owner of the Norwalk Hatchery, expects to take off about 20,000 goslings this spring and summer. "Wish I could hatch three times that many," he says, "for it would be no trouble to sell them. But we won't be able to hatch more until the flocks are built up and we can get more eggs."

Alleshouse has installed new incubators built especially for hatching goose eggs. The trays are built so that the eggs can be tipped at a much steeper angle than chicken eggs and have tops to keep the eggs from rolling out.

"There are tricks to hatching goose eggs," Alleshouse says. "Hatcherymen have spent a lot of time and money trying to figure out the best ways to moisten the eggs. Now we just take the trays out of the incubators every few days and dip them in water."

No one quite knows why goose eggs should be dipped in water or sprayed heavily, but there is a parallel in nature. Geese, nesting in the wild, leave the nest and tramp through the dew laden grass early in the morning or they swim around for a few minutes before they return to the nest, then settle their wet feathers over the clutch of eggs.

Part of the high cost of producing goslings in hatcheries can be chalked up against the labor involved in dipping or spraying the eggs. Also, it takes four times the space to hatch a goose egg as it does for a chicken egg, and it takes chicken eggs only 21 days to hatch against 30 days for goose eggs.

Kollar paid $1.50 each for the goslings he purchased from Alleshouse, which any hatcheryman will tell you is about the lowest price in the country for goslings, even though these prices for individual birds usually startle the chicken farmer. The average price for goslings is from $2.00 to $2.50. Other hatcherymen wonder how Alleshouse can afford to sell them so cheaply. Alleshouse has figured this angle carefully.

"When we produce them in large numbers," he says, "we can make a good profit at our present prices. That's as much as I'm asking for. What I would like to see is the price of goslings kept to a level where farmers can afford to start a flock each year for the holiday markets as they do for turkeys. When the prices are too high about all he can afford to use the stock for is breeding and producing more goslings because he will have too much in each bird to make a profit selling them for meat."

He pays the farmers 30 cents each for goose eggs, and at the end of the season sends them a bonus of one cent for each per cent in hatchability of the eggs above 50 per cent.

Alleshouse really got his start in the goose industry when he agreed to purchase eggs from a flock of 400 originally owned by the poultry department of Ohio State University. The University poultrymen had developed the birds to the place where they thought they would make good commercial stock. Professor E. L. Dakan had purchased a pair of Roman geese at the World's Poultry Congress, at Cleveland in 1939. The Roman geese were chosen because they have high egg production. They lay 40 to 50 eggs a year if the eggs are removed from the nests every day. In addition, the Roman goose has the weight required of a good commercial goose. When one of the University geese died, its mate was crossed with an Embden. This was the start of a long breeding program which, coupled with careful selection, eventually gave the University farm a flock of 1000 fine geese.

Kollar is convinced that the Roman-Embden cross is better for commercial flocks than any of the six standard breeds of geese in this country. All domestic geese descended originally from wild geese. They have been domesticated for so many centuries that there is little record of when the goose actually adopted man as his keeper. The six common breeds in this country are the Toulouse, Embden, African, Chinese, Egyptian, and Canadian or wild goose. Pilgrim geese (Farm Quarterly, Winter, 1947) are being raised in a few widely scattered flocks by farmers who prefer them because the sexes are colored differently. The breeds generally found in barnyard flocks are the Toulouse and Embden. An adult Toulouse gander will weigh about 26 pounds, while his mate will weigh 20 pounds. The Embden gander weighs 20 pounds and the female 18. Most farm produced market geese average less than 15 pounds.

Kollar feels that of all poultry, geese need the least care after they get a good start. "I haven't found that you can raise them on pasture alone like some people say," he explains, "but they can pretty well take care of themselves most of the year."

Goslings Are Cute

Kollar likes his geese. "The goslings are cute little fellows," he says. "You can teach 'em to come when you whistle for them at feeding time: a duck would never have sense enough to do that. Sometimes, though, if you just stand in the brooder house and watch them it's enough to

Inoculated Legume Crops, YOUR CHEAPEST SOURCE for . . .

- Soil-Building Nitrogen
- Bigger, Better Yields of Hay and Seed
- More Meat, More Milk

Inoculation with NITRAGIN takes only a few minutes . . . costs only a few cents an acre. Why take a chance? Ask your seedsman for the inoculant in the orange colored can.

THE NITRAGIN COMPANY, INC.
3927 N. Booth St. Milwaukee 12, Wis.

Find out how

CLEAN PLOWING
• FIGHTS CORN BORERS
• WINS EXTRA PROFITS

Clean plowing once over is "smart farming" anywhere, but especially where corn borers chew up profits. Find out how the LANTZ KUTTER-KOLTER helps a moldboard plow to cut through and turn under tough hybrid stalks and roots, combined straw, cover crops, trash of all kinds, saving time and money. Nothing else like it. Thousands in use.

NOW IS THE TIME . . . do the job right with this double blade Lantz.

WRITE today for this **FREE** illustrated folder telling how others are profiting by better plowing with the double-blade Lantz Kutter-Kolter.

We also manufacture the famous Lantz original Flexible-Grapple Hay Fork and the Lantz Sickle Grinder.

FREE **MAIL THIS COUPON NOW**

Lantz Manufacturing Co., Inc., Dept. 51
Valparaiso, Indiana

Please send me Free illustrated folder on better plowing with the Lantz Kutter-Kolter.

Name ..... R.F.D. .....

City ..... State .....

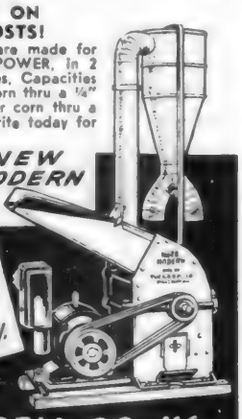
If you feed Hogs, Cattle, Sheep or Poultry you need a BELL "Modern" Hammer-Mill to get the most profit out of farming.

GRIND YOUR OWN GRAIN & ROUGHAGES

Cut feeding costs from 20 to 40% and increase the weight of stock animals by feeding home-grown, GROUND shelled or ear corn, with or without shucks, oats, wheat, alfalfa, clover and soy bean hay. A BELL "Modern" Hammer-Mill will do it for as little as ¾ of a cent per hundred pounds. 1000 pounds of properly ground feed often produce as much Milk or Meat as 1250 lbs. of unground feed, thus the highest possible Feeding Value for growing pigs, and other stock animals is obtained at the lowest cost per pound of increased weight.

SAVE MONEY ON GRINDING COSTS!

BELL HAMMER MILLS are made for ELECTRIC or ENGINE POWER, in 2 Universal, Low Cost, Sizes, Capacities up to a ton of shelled corn thru a ¼" screen, or 1400 lbs. of ear corn thru a ⅜" screen, per hour. Write today for full information.



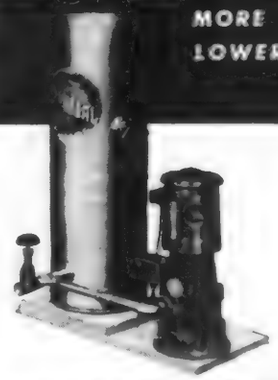
BELL'S NEW MODERN HAMMER-MILLS

Send for Special Illustrated Folder and Prices today.

THE C.S. BELL CO. Mfrs.
Dept. F. HILLSBORO, OHIO.
CORN SHELLERS HAMMER-MILLS FEED MIXERS

UNIVERSAL PUMPS

MORE WATER LOWER COST



No matter what your pumping needs may be ...check first with Universal...A complete line of injector and centrifugal type pumps and water systems for the home, farm and industry.

Universal has both Deep Well and Shallow Well Multi-Stage Pumps (figure above) with a wide range of uses...operating at pressures exceeding conventional type pumps...pumping lifts to 500 feet.

UNIVERSAL PUMPS

Learn About Universal...

Inquire today, find out for yourself why Universal is rated as the "performance pump" by all who own one.

UNIVERSAL MFG. CO., Dept. Q 3
1440 San Pablo Avenue, Berkeley 2, California
Please send illustrated literature on Universal Pumps and the name of my nearest Universal Dealer.

*Name*_____

*RFD*_____ *City*_____ *State*_____

drive you crazy, the way they run around." Goslings will stage a marathon, all circling the brooder in the same direction, hour after hour. They never seem to rest and when the doors are open so they can go out in the yard, they run out, then back, to start all over again. This goes on day and night.

He starts his goslings in a brooder house in June where he keeps them under heat for about six weeks. The temperature is kept the same as for chickens. The young goslings are fed on chick starting mash, for which Kollar has never found a substitute. After they are six or eight weeks old, he turns them out on good pasture where they can feed themselves for a few weeks. About the middle of June when the pasture starts to get tough and doesn't grow as fast, he starts feeding grain. If they are kept on pasture when the pasture isn't good, they start losing weight, get weak and start dying. Grain is fed until the following spring when the geese can once more be pastured. The breeders are fed a protein feed from February on, to stimulate egg production.

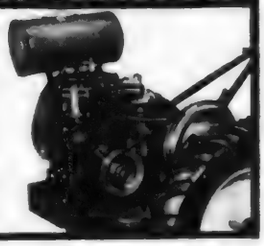
The market geese usually live with the breeding flock and are culled out of the flock when the Chistmas and Thanksgiving holidays roll around. They are usually kept until they are six months of age because the flesh is firmer and the price is better. If they are sold younger they are called "green geese", and although Kollar could sell green geese, he makes more by finishing them out in time for the holiday trade.

Sexing geese has always been a major problem with farmers since the birds look much alike. They mate for the season and selling a mated bird during the breeding season can break up a producing team. "When they're full grown," says Kollar, "you can tell them apart by the way the ganders handle themselves. They just look like dandies. They strut around more than the females and their voices are deeper. They also have thicker necks." Kollar can pick them out at a glance, but his hired hands, who have had less experience with geese, find it difficult. Kollar, like most commercial goose raisers, keeps one male for every three females.

Once Kollar's geese leave the brooder house they spend the rest of their lives in the open and seem to prefer this arrangement. "They can stand the hot summer sun or they can stand below-zero temperatures," he says. "At ten above zero I've seen them out playing in the snow, having a wonderful time. Last winter I arranged so they could go in the shed on cold days. One night, when the temperature was ten above zero, I watched them and they stayed outside most of the time. They occasionally wandered into the house for a bit of feed or a drink of water, but came right back out."

In cold climates it is best to have a shed where the geese can get out of the weather

Springfield GARDEN TRACTOR



Two models: 2 hp at $149.50 and 3 hp at $214.50 (f.o.b. Springfield) Cultivator, sickle bar, plow, and other attachments. Distributors, dealers solicited.

QUICK MFG. INC., 3365 S. Limestone St., Springfield, Ohio

PARKS' BARRED ROCKS

WORLD'S OLDEST STRAIN

ONE BREED ONLY

BIG BIRDS! Terrific Layers! U.S. —R.O.P. records to 349 eggs and flock averages over 250. Pullorum Clean & U.S. Certified. Chicks grow fast and don't need to be pampered. They can take it! Write for Catalog.

JOE PARKS & SONS, ALTOONA, PA.

HAMPSHIRE SHEEP

An outstanding Breed for up-to-date farmers who want Profitable Producers.

Booklet and Breeders' list free.

AMERICAN HAMPSHIRE SHEEP ASSN.
72-Q WOODLAND AVE., DETROIT 2, MICH.

Raise TURKEYS THE NEW WAY!

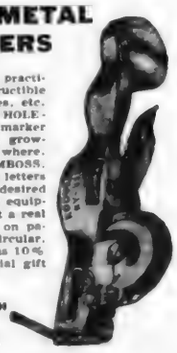
Write for free information explaining how to make up to $3,000 in your own backyard. *Address:*

NATIONAL TURKEY INSTITUTE
Dept. 145 Columbus, Kansas

ROOVERS SAMPLE

MAKE YOUR OWN METAL GARDEN MARKERS

ROOVERS Label Embosser is the first practical lifetime device for making indestructible metal labels for all plants, shrubs, trees, etc. NEW PATENTED SELF-CONTAINED HOLE-PUNCHING DEVICE makes this metal-marker indispensable to nurserymen, florists, growers. Tells instantly what is growing where. Great fun to spell out the label and EMBOSS with easy pressure, in beautiful raised letters on spray-and-acid-proof metal. Any desired wording or length. Great for marking equipment, tools, etc. Not a "gadget," but a real indispensable tool to put your garden on parade. Complete with instructive circular, $2.25, postpaid in U.S. and Canada, plus 10% U.S. Excise Tax. $2 extra for Special gift box. Money-back guarantee.



ROOVERS JOSEPH M. LOTSCH PRESIDENT
1428—36th St., Brooklyn 18, N. Y.

if they like, but shelter is not one of the big investments in raising them.

Kollar's geese lay on an average of 40 eggs a year, mostly between the months of February and June. At 30 cents for each egg, one female goose brings in the same returns on eggs as does a chicken producing 288 eggs a year at 50 cents a dozen.

"A breeding flock should have water, a pond or stream where they can swim," Kollar says, "but I don't have water for them here on this place and they still seem to do well." A swimming spot is not a necessity for raising geese.

Kollar is installing his own incubator and plans to hatch the eggs he gathers this summer. He provides barrels and boxes in the yard for them to lay in. The females will return to the same place each day to lay. If there are no boxes for them to use as nests they lay their eggs on the ground. This makes egg gathering difficult. And since the first laying often starts in late February the eggs soon become chilled, which can cut down their hatchability.

The basis of Kollar's feed for adult geese is always corn, because it is about the cheapest feed available and the geese do the shelling. "I don't raise any grain on the place here," he explains. "I buy it all, and once every ten days have a load of corn hauled in. That's about three tons." He buys wheat screenings by the carload, and these with corn will fatten geese. Buckwheat or barley are also good feeds. Few goose raisers have set formulas for grain mixtures for adult geese. The birds eat and get fat on whatever grain is set before them.

Kollar says that the most expensive corn he ever fed was some that his geese selected personally. There were seven acres of it and, unfortunately, it belonged to a neighbor, a fact which the birds could hardly be expected to know. When they found a hole in the two-foot mesh wire fence which Kollar keeps around their yard, the grain disappeared. "We didn't even know they had been in the corn until my neighbor went in to pick it," Kollar recalls. Kollar offered the neighbor, a life long friend, $300 for the seven acres of corn. "Figured that was a fair price," he said. The neighbor didn't quite agree and decided to sue Kollar for $3,500. The case still hasn't been settled, but Kollar says goose farmers can save themselves trouble and friends by having a good fence, for while geese can't fly over a two-foot fence, they can push through holes that look much too small for them.

Market geese turned a good profit last year during the holiday seasons. Kollar ships his to Detroit where they are sold primarily to people of foreign descent. He sold them at 45 cents a pound live weight and figures he cleared about $2.50 per bird in 1949. This was a 40 per cent profit on his investment before he deducted the cost of his time. Some geese raisers are making good money on their flocks by selling the eggs to hatcherymen, but with the present high prices and the demand for goslings,

English Type
RAIL and HURDLE
FENCE
Large Stocks . . .
Prompt Shipments . . .
Hand Split Chestnut Rails.
Peeled Chestnut, White Cedar
or Locust Posts
WHITE CEDAR
SCREEN FENCE
For Privacy
Used around swimming pools, gardens or as boundary fences. Small animals cannot pass. Various heights which can be varied in curves or rectangular breakdowns.
All Copper
LANTERNS
Electrified
RUSTIC TABLES
6 and 8 ft. long, frame work—Northern White Cedar. Tops and seats—Western Fir.
Write for Catalog . . .
WOOD PRODUCTS CO. TOLEDO 12, OHIO

Get more Profit from your Farm

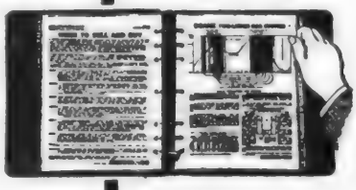
Would you like

—to know *when* to sell and buy?
—to sell at better than average prices?
—to know what prices are ahead on crops, livestock, hogs, etc.?
—to know whether it is more profitable to feed grain or sell it?
—to know which farm enterprises are most profitable?
—to have answers to the hundreds of questions facing you daily?

You can farm more profitably by knowing the answers, and by following closely the practical advice in the

DOANE AGRICULTURAL DIGEST

and its twice-monthly releases. Thousands do . . . Prepared by the oldest and largest farm management and appraisal organization for the guidance of its own farm managers (operating *for profit* hundreds of farms, ranches and plantations), the results of this wide experience are contained in the Digest . . . This 450-page loose-leaf reference volume covers every phase of agriculture. It is kept up-to-date by twice-monthly releases, which interpret trends and predict outlook on prices, production, markets, shortages and surpluses ahead . . . Particularly important each month are releases on "When to Sell and Buy", "Important this Month" and "Business and Agriculture" . . . Farmers, ranchers and business men in every State, in Canada and Mexico, use the Digest because *it pays*.

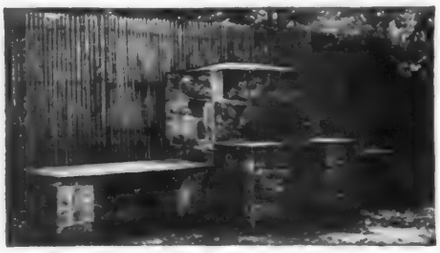


Write today for
FREE SAMPLE RELEASES
and learn how the Digest can help you get more profit from your farm.

DOANE
AGRICULTURAL SERVICE, Inc.
Box 245 5142 Delmar Blvd.
St. Louis 8, Mo.

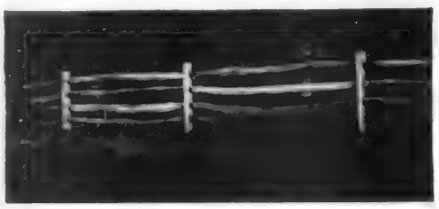
DU-BOIS
Reg. U. S. Pat. Off.

WOVEN WOOD FENCE



Affords privacy and protection. Beautifies and screens from automobile glare. For country estate, suburban home, city lot or penthouse. Makes a lovely background for garden vines and plants. Moderate prices. Easy to erect. Never requires painting. Lasts for a generation.

3 styles—Close Woven—Close Cleft
Open Cleft
Heights 18", 3' 10", 4' 11", 6' 6" & 8'



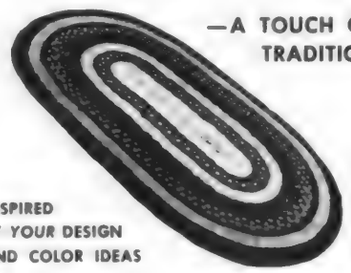
DUBOIS Old Fashioned Post and Rail Fence

The favorite fence for suburban and country homes. Hand split chestnut, with either chestnut or locust posts. 2, 3 or 4 rail styles, 4 feet high, creosoted post ends.

Write for free folders

DUBOIS FENCE & GARDEN CO., Inc.
Ridgefield, New Jersey
& 3990 Chevy Chase Dr., Los Angeles

French Trail Braided Rugs



—A TOUCH OF TRADITION

INSPIRED BY YOUR DESIGN AND COLOR IDEAS

Your color and design ideas are carried out completely in French Trail Braided Rugs. Just pick your colors from our color card—or send us a sample to match. We'll hand-make a soft, luxurious rug exactly to your directions. If you wish, you can see your rug before a stitch is taken. Traditional French Trail rugs are made from fine, resilient wools hand-sewn with invisible Nylon stitches. They hug floors tightly *without* pads. Round or oval sizes up to 16' by 26'. Distinctive, long-wearing and guaranteed.

Send 50c for color card, color picture and descriptive literature.

FRENCH TRAIL INDUSTRIES
BOX 291-J, ST. MARYS, OHIO

☐ Send color card, color picture and literature. I enclose 50c.

☐ Include information on ☐ round ☐ oval rug.

Size_____ft. by_____ft.

NAME_____

ADDRESS_____

CITY & STATE_____

the temptation is great to keep the eggs and try to build up breeding flocks.

In addition to the income from market geese and eggs, which incidentally have a strong taste and are seldom used for cooking, geese produce a long list of by-products which find ready markets.

Goose livers, the pride of the gourmet the world over, have lost little of their time-tested popularity. Forced feeding, or noodling, is still widely practiced in Europe. The geese are confined to a small pen or crate and force fed by hand several times daily. Noodles of cooked dough made from grain flours are forced down the goose's throat. After the goose builds up its body tissue, the liver starts to enlarge and fatten. When butchering time comes the liver is several times it normal size, often weighing two or three pounds, and demands a high price as *pate de fois gras*. Forced feeding is outlawed in much of this country.

The body fat of geese is another human food, while the intestinal fat which has a low melting point, is sold to cosmetic manufacturers and pharmaceutical houses.

One of the most famous goose farms in the country is the one operated by George Scheufele in New Jersey. Scheufele's major crop is powder puffs made from goose skin. He plucks the feathers, selling them to a variety of outlets: makers of darts, Indian headdresses and women's hats use goose feather. The meat is boned, cooked and canned on the farm. The feet, beaks and bones are ground for fertilizer. The plucked hides are covered with a fine soft down, one of the warmest and softest materials in nature. The hides are processed and cut into powder puff shapes and finished by hand. They are dyed delicate colors and by the time they reach the department stores they bear price tags of a dollar each and up.

HOW TO KEEP BEES

Pollination is very important to the successful growing of legume, fruit, and vegetable crops; and Honey Bees are by far the most dependable instruments of pollination.

Let us send to you at no charge, booklets on beekeeping, Extension Bulletin #253 which tells of experiments with Honey Bees and clovers, and your 1950 catalog of Root Quality Bee Supplies — Everything you need to start this spring in time for the early fruit blooms and the clovers that follow.

THE A. I. ROOT COMPANY
DEPT. 30 - MEDINA, OHIO

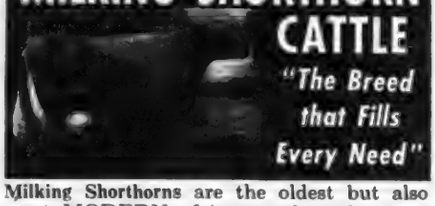
For NEW HAMPSHIRES Write
NICHOLS
of KINGSTON, N. H.

Bred to the Core for Meat Profits

Healthy, lively chicks from the nationally popular broiler strain will make money for you. Give you high quality that brings top market prices, yet at low production costs. Air shipments to all points in the U.S. Free catalog has full color pictures of Nichols N.H., U.S. Approved, Pullorum Clean breeders—worth sending for. Write

NICHOLS POULTRY FARM, INC.
BOX 31 KINGSTON, N. H.

MILKING SHORTHORN CATTLE



"The Breed that Fills Every Need"

Milking Shorthorns are the oldest but also most MODERN of improved cattle representing 65% of all the cattle of England! Reason? THEY PAY!

Dual-Purpose qualities make **Milking Shorthorns** farmer's favorite and America's Fastest Growing Breed!

For FREE information about **Milking Shorthorns** and FREE copy of Milking Shorthorn Journal write:

American Milking Shorthorn Society
4122 S. Union Ave., Dept. FQ, Chicago, Illinois

FOOD WHERE CROPS NEED IT

(Continued from page 69)

drilling the fertilizer in bands will give greatest returns.

Top dressing alfalfa is not so simple as with the grasses. Nitrogen will not be needed since alfalfa, a legume, will be adding nitrogen to the soil in greater quantities than it needs for its own growth. Phosphones, used as a top dressing will be of some value, but it is much more economical to apply all of the phosphones that the crop will need in bands at the time of planting. Should the same be done for potash? Definitely not! If enough potash is put on the land to last for four or five years, the first few cuttings of hay will contain 40 or even 50 pounds of potash (K_2O) per ton, when only 25 pounds will give as good yields of high quality hay. Not only that, but the hay will have more calcium and magnesium in it if it contains but 25 pounds of potash. The answer is to put on enough at planting to get the alfalfa well established and then top dress it every year with muriate of potash or a high potash mixed fertilizer The top dressing should be applied after the first, second or third cuttings.

In all crop fertilization, let's remember that responses to fertilization will be obtained only where the added plant food is correcting a limiting factor in production. If some condition other than plant food limits production, such as lack of moisture, soil aeration, disease, or insects, then adding plant food is like putting an extra quart of oil in a car that is out of gas.

THE AUTHOR—Dr. A. J. Ohlrogge was born and raised on a dairy farm at Chilton, Wisconsin, but his professional interests have led him from animal husbandry to a concentration on soil fertility. He received his under graduate training at the University of Wisconsin and was given a Ph.D. by Purdue University where he now works as Assistant Professor in Agronomy. At present he is conducting a number of fertilizer placement studies, among them a radioactive tracer phosphate study with corn.

NEW BEES FOR OLD

(Continued from page 71)

rally mated to hybrid drones developed from two inbred lines of entirely different origin. Their progeny will have exceptional hybrid vigor since they will contain the good features of four original lines of bees. These last four-way hybrids are the bees in which commercial honey producers are especially interested since they are the ones which will produce more honey than naturally developed bees, and which will eventually have a more gentle disposition. They cannot, however, be used for producing additional stock since, if their offspring were naturally mated, the offspring would have lost the hybrid vigor originally obtained from inbreeding.

Once they begin to produce hybrid breeding stock, the bee breeders must depend on Kelley's Island to supply additional seed stock or replacements for any of the original queens that might die. If they saved descendants of the queens beyond the first generation, they would, due to inbreeding, be worse off than they were before the hybrid was invented. Their stock would be so highly inbred that the results to the bee man would be as disastrous as if he were growing hyrid corn and saving his own seed.

The basic research into the heredity of bees and the decisions as to what crosses will be made on the island, are completed at two widely separated spots on the mainland. While Dr. Roberts delves into the problem in his bee lab at Madison, Wisconsin, Dr. Mackensen works along similar lines at Baton Rouge, Louisiana. They then compare notes and after much screening decide which crossings will be made on the island.

On the island the virgin queens are allowed to mate naturally, because all the drones within her range are of known parentage. But at other research centers, where natural matings occur while the queen is on the wing and perhaps with several drones during the breeding season, breeding work must be done by mechanical insemination. This unromantic method of fertilizing queen bees has been underway for the past 20 years, and has gradually been perfected until today the growing number of queen breeders are becoming skilled in the fine points of mechanical bee breeding.

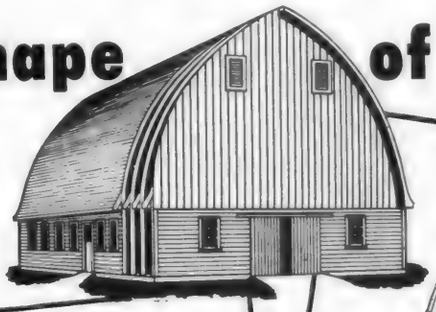
Nature provides a sack within the body of the queen where semen collected in matings is stored. The sack is just above the ducts through which the eggs move toward the outside. This is a handy arrangement for the queen. As the egg passes through her body she can fertilize it or not by either opening the semen pouch or leaving it closed. The fertilized egg will hatch into either a worker or a queen. The eggs which the queen fails to fertilize hatch into drones. Thus, the drone is half orphan from the beginning. He never did have a father.

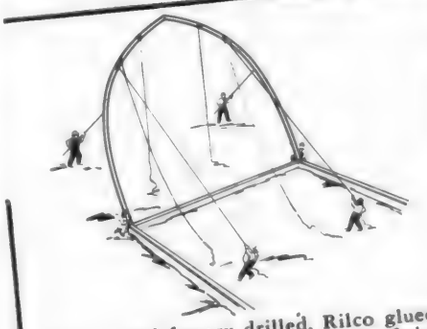
The job of mechanically inseminating a queen bee is a painstaking one, requiring a meticulous technician. The basic piece of equipment is a bee holder mounted on a block of wood or metal. There is a small glass funnel into which the reluctant queen is forced head first. Tiny metal spreaders hold her vagina open for the operation. While she is held in the glass funnel a small syringe containing semen collected from selected drones is used to inseminate the queen.

Queen bees don't seem to take to this treatment without being subdued, so in the course of his research, Dr. Mackensen found the ideal method of quieting them. He learned that, given a dose of carbon dioxide gas, they had no objections to being mechanically seduced. He soon learned that the carbon dioxide had one other very important quality as an anaesthetic. Normally virgin queen bees will not lay eggs for several weeks even though they are artificially inseminated. If mechanically inseminated while under the influence of carbon dioxide, however, she comes away from the treatment quite willing to take up the duties of motherhood immediately.

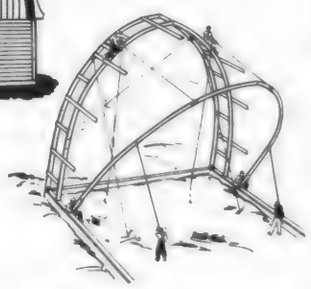
Another practical application of these findings is that virgin queens once treated with the gas will start to lay eggs even

The shape of barns to come!





Pre-cut and factory drilled, Rilco glued-laminated rafters need no sawing or fitting on the job. Half arches are connected at the ridge before erection. In jig time, the first framing arch of your barn swings up, and fastens to the sill with angle irons and bolts. This barn *can't* slip, or sway, or sag!



Now Rafters No. 2 and 3 go up in a matter of minutes, and tie together with light boards until sheathing is applied. Rilco Rafters with their steel connections make the barn rock-solid. No wonder they call this the "barn of tomorrow." It's strong . . . streamlined . . . wind resistant . . . has *no interior posts!*

And there it is . . . half built. A shape to please the artist and the engineer as much as the farmer. Want a barn like this . . . or a poultry house, hog house, corn crib, granary, machine shed? Rilco has 'em all. Ask your lumber dealer. And mail the coupon for literature!

You Buy Your Barn Half Built with . . .

RILCO RAFTERS

MAIL THIS COUPON TODAY!

RILCO LAMINATED PRODUCTS, INC.
1396 First National Bank Bldg., St. Paul 1, Minn.

Please send literature on RILCO RAFTERS for
( ) Barns ( ) Poultry Houses ( ) Hog Houses
( ) Corn Cribs and Granaries ( ) Machine Sheds

*Name*_____

Address (RFD) _____

*City*_____ *Zone*____ *State*_____

RILCO LAMINATED PRODUCTS, INC., 1396 First National Bank Bldg., St. Paul 1, Minnesota

The Hybrid Honey Bee
FOR POLLINATION

This is a let alone bee, gentle, industrious, very active, well-adapted for pollination. (See page 70, this issue). Follow its use and development through the *American Bee Journal*. Send for free, sample copy and our free, descriptive catalog of bee supplies for 1950. *American Bee Journal* subscription, one year, $2.00.

DADANT & SONS, INC.
BOX 42, HAMILTON, ILLINOIS

MAKE MORE MONEY

WITH BEES AND HONEY

MUTH'S BIG 1950 BARGAIN CATALOG offers bee keeper's supplies direct at lowest prices. There's always a demand for honey—and good profits in beekeeping. We'll buy your honey.

BIGGER CROPS—BETTER PROFITS

You'll have bigger crops when you keep bees. Bees pollinate your orchards, garden and field crops. You can increase farm yield and make money from your honey crop. Write for FREE catalog and full details TODAY!

FRED. W. MUTH CO. Pearl and Walnut Sts., Dept. 221 Cincinnati 2, O.

though no semen was introduced into their bodies either manually or naturally. This opens a whole new field for inbreeding. The unfertilized eggs hatch into drones, fatherless young, which can then be bred back to the mother queen. This is the type of inbreeding which produces hybrid vigor. Previous to Dr. Mackensen's discovery of the strange affect of carbon dioxide on a queen bee, careful control of blood lines was almost impossible because virgin queens could not be convinced that they should lay eggs.

These new findings on controlling the love life of the honey bee, coupled with the unusual opportunities of putting them to work on an isolated island, are big news to bee keepers both in this country and abroad. The only change bee keepers would suggest for the conduct of this experimental work is to find some method of speeding the whole thing up. Now after several thousand years of letting the honey bee do its best and taking what came of the effort, honey producers see a new age of efficiency on the horizon. Charles Mraz of Middlebury, Vermont, said of the hybrid queens. "They are the first queens that are better than my own stock, and I've been buying queens for the last 20 years." One large scale Ohio honey producer, figures he reaped a 50 per cent bigger honey harvest from the 50 hives where he installed hybrid queens last year than he did in those hives with his old line stock. Such reports are not long getting noised around in the bee world, and consequently bee men across the nation have one eye on Kelley's Island.

LETTERS (Continued from page 12)

CALL FOR BACK ISSUES

Sir:

I am one of your new subscribers and would like to have the names of some of the people who have had subscriptions to your magazine since the beginning of the publications. I would like to get some of the first issues.

Henry F. Gustine
2738 General Ogden St.
New Orleans, La.

1120 POUND PET

Sir:

The enclosed picture of my seven year old daughter with her 1120 pound Brahman steer was so good I thought that you might be interested.

I produce Brahman and Hereford cattle on

my farm and your articles have been a great help to me. That is why I gave one-half dozen subscriptions of The Farm Quarterly to friends last Christmas.

J. S. Mitchell
Cullowhee, N. C.

(Continued on page 140)

barn-cured hay means
EXTRA PROFITS

A hay-drying system in your mow means much greater feed value, much higher sales value and insurance against the weather risk. But remember, your drying system can only be as efficient as the fan which does the work. That's why a Hartzell fan is essential. Hartzell fans have proved their way since 1926 in industry and on the farm. *They move air economically.*

Hay cured the Hartzell way is *better*. It can be cut when it's at its peak—green, succulent and with its full vitamin content. It brings top prices on the market because it has 20% more leaves and 50% more green color. The field-curing weather risk is practically eliminated because the hay can be hauled into the mow within three or four hours after cutting.

Complete information on all types of agricultural drying problems furnished free—sketches, diagrams, data. Write for your copy today.

The Hartzell fan gives extra air drying at lowest power cost. It cannot overload your motor. No gauges to watch and no adjustments to make. The motor can be used for other farm tasks.

DEALERS: A few territories still open. Write today.

HARTZELL PROPELLER FAN CO. AGRICULTURAL DIV. PIQUA, OHIO

Let's Talk Turkey About This Threat To Your Welfare

Some time ago the anti-trust lawyers from Washington brought suit to put A&P out of business.

They asked the court to order us to break up our stores into seven groups and sell each group to new owners; to sell our factories to still other new owners; to disband the Atlantic Commission Company; and to close all our central buying offices, including the National Meat Department, the National Dairy Department and the National Egg and Poultry Department.

Since that time, hundreds of thousands of farmers, as individuals and through their organizations, have been adopting resolutions, writing letters and running ads expressing their opposition to this suit.

The Farm Bureau Federation, at its recent annual convention in Chicago, adopted a resolution that did not specifically refer to the A&P suit, but condemned current interpretations of the anti-trust laws. The resolution said in part:

"Regulations should not be used to eliminate the possibility of integrated systems that are efficient and competitive. Such systems have the possibility of bringing about a badly-needed reduction in the margins that now exist between the producers and consumers of many items."

The reason farmers are taking a stand against this suit is because they recognize that it is a threat to their welfare; a threat to all agriculture; and a threat to our national economy.

Have you figured out how much this suit could hurt you?

A Threat To Better Distribution of Your Product

A&P is the largest and most efficient distributor of farm products.

Obviously, this attack is a threat to the welfare of all the farmers who sell to A&P, for they will have to seek new outlets for their products.

That will mean greater sales effort and higher sales costs for them.

But it will have an adverse effect on millions of farm families who don't sell to us at all.

For the great amounts of food we move into consumption, the great merchandising effort we put behind food sales, tend to strengthen farm markets and boost the income of all farm families.

Everyone wants the farmer to get good prices for his products. After all, we can't have a prosperous country unless we have a prosperous agriculture.

The price you receive for your product is the retail price, less the cost of distribution.

To maintain good prices to farmers, therefore, we must eliminate unnecessary in-between handling costs and operations.

A&P was founded and has operated for 90 years on the theory that the best way to attract and hold customers and build bigger markets for farm products is to give the public more good food for their money.

In order to do that, and at the same time do a good job for agriculture, we have had to work constantly to find better and less expensive methods of distributing food.

As a result, we have narrowed the spread between farm and retail prices.

The methods we pioneered have been adopted by other food distributors.

All agriculture has profited from them.

Today farmers get a larger share of the consumer's dollar. Their sales are higher. Their income is greater.

This suit threatens to wipe out many of these gains.

Don't you think agriculture will be hurt by this attack on its most efficient marketing outlet?

A Threat To Your Living Standards

The farmer is a consumer as well as a producer.

His "real" income is determined by how much he has to pay for all the things he buys.

This applies to food, as well as clothing and other necessities. For today, with the development of cash crop farming, practically no farm family produces all the food it needs.

A&P was the first of the nation's chain stores. Together with the other chains and mail order houses, it has worked to keep living costs down and living standards up.

The public has shown that they like our method of distribution by giving us and other efficient distributors their patronage. We are big because the public made us big.

If the anti-trust lawyers win this suit, a legal precedent will be established that can be used to attack anybody who tries to do a better job, give his customers a better deal, and grows big in the process.

Don't you think your living costs will go up if the company that has done most to keep them down is destroyed?

A Threat To Our National Economy

That is why we say that the big issue here is not whether A&P engaged in some practices that allegedly violated the anti-trust laws. We know we didn't. We know that we have always tried to run a good, clean business. Even if there were something wrong with our methods of operation, it wouldn't be necessary to burn down the barn to get rid of the mouse.

The real question here is whether the anti-trust laws, which were designed to preserve competition, can be turned around to reduce competition.

The real question is whether we are going to continue to encourage people to do a better and more efficient job; or whether we are going to let the lawyers in Washington blow the whistle on anybody who gets a little bigger than his competitor.

Frankly, we admit that nobody needs worry about the owners of A&P. They could make a great deal of money by breaking up this company and selling off the parts as the anti-trust lawyers wish.

But we think you and every other American should worry about the kind of economic policy the anti-trust lawyers are trying to impose on this country — not by way of Congress, as it should be, but by way of court decrees.

You may not sell to A&P or buy from A&P.

But this is your problem, too.

You don't have to believe us.

Think it over and talk it over with your friends and neighbors.

Decide for yourself.

Atlantic Commission Company

and

THE GREAT ATLANTIC & PACIFIC TEA COMPANY

READY TO BEAR
PLANTS and TREES

Buy our bearing age "STATE INSPECTED" Stock. Have fruit to eat and sell within 60 days, this year. Why Wait?

BRUNS MARVEL
The sweetest, most "Acid-Free" everbearing strawberry. For folks who can't eat strawberries. See Special half price offer below.

MORTGAGE-LIFTER—Extra early Black Raspberry. Offered exclusively by us.

BLUEBERRIES—Grow large as a nickel. Sweet. Easy to grow.

STREAMLINER Everbearing Strawberry. 3 crops in 18 months. Bears June to winter.

Special "Get Acquainted" Offer
BRUNS MARVEL
Acid Free Everbearing Strawberry
50 plants for $1 Post-paid

Send for FREE CATALOG
40 Pages in Natural Color

SPECIAL BARGAINS POSTPAID

10 Thornless Boysenberry	$1.00
10 Mortgage Lifter Raspberry	1.00
25 Streamliner Strawberry	1.00
12 Morrison Raspberry	1.00
5 Assorted Cushion Mums	1.00
12 Latham Red Raspberry	1.00

SOUTH MICHIGAN NURSERY
Box 350, New Buffalo, Michigan

MAKE $1000 A MONTH IN YOUR SPARE TIME

HOW TO MAKE LUMBER — FREE BOOK

ONE-MAN SAWMILL GIVES YOU EXTRA CASH IN "OFF-SEASON"

TAKE your BELSAW Portable Sawmill right to the trees—turn out valuable lumber for local yards, all kinds of building material—do "custom sawing" for neighbors. Thousands of satisfied owners. One writes; "I make $1000.00 a month, and do it easy!" No crew needed. Power with old auto engine or tractor. Fast mechanical feed, positive top dogs, steel construction, safety features. Beginners get excellent results at once. BELSAWS last a lifetime. Low factory-to-you price. pay only $62.50 down. Build a big-profit business. Send postcard for valuable FREE BOOK, "How To Make Lumber."

BELSAW MACHINERY CO
57C Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

AMERICA'S FASTEST GROWING BEEF BREED

Proof of the profit-making ability of Angus cattle is the rapid growth and expansion of this popular breed. In 1949 the Aberdeen-Angus breed was the only major beef breed showing increases in both registrations and transfers of purebred cattle. More new herds were established than in any previous year in the history of the association. For information write: Dept. FQ,

American Aberdeen Angus Breeders' Association. TOMORROW'S BEEF CATTLE TODAY. Chicago 9, Illinois

ROTO-HOE

2 H. P. ROTO-HOE only $134.00

Roto-Cutter attachment $40.00.

Ask your Dealer for demonstration or send postcard for FREE folder.

Dealer Inquiries invited

America's MOST USABLE GARDEN TOOL!

Acclaimed everywhere shown as America's finest Garden Cultivator for small and medium gardens.

ROTO-HOE and Sprayer Co.
BOX 7, NOVELTY, OHIO

THE FARM'S PICTURES

Cover by: George Hoxie

5—Harold M. Lambert. 8—Joe Clark. 22—Forsythe-USDA. 23 — Hal Costain. 24 — Arthur Dodd. 25 — Forsythe-USDA; Joe Clark. 26 — Forsythe-USDA. 27 — Skip Ayers. 28 — Caterpillar Tractor Co. 29 — Bennett-SCS. 30 — Harold M. Lambert. 31 — Forsythe-USDA; Godsey-*Monkmeyer*. 32 — U. S. Army; J. C. Allen & Son. 33—Dr. Geo. P. Broussard; Ivan Y. Scherr. 34—Joseph Rainaldi. 35—V. S. Asmundson-U. of Calif. 36—Joe Munroe; Harold M. Lambert. 37—*Du Pont*-Joe Munroe. 38 — Joe Munroe. 39 — Forsythe-USDA; T. M. Josephson-U. of Kentucky. 40 — George Hoxie. 41 through 43—Cy La Tour, 44 through 51 — Howard J. Sochurek. 52 — USDA. 53 — USDA; Wilson & Co. 54—SCS. 55—Latham-SCS. 56—SCS; B. U. Bowman. 57—Webb-SCS; SCS. 58—Rothstein-USDA; USDA. 59—USDA. 60 — National Board of Fire Underwriters. 61—National Board of Fire Underwriters; Porto Pump, Inc.; The Fyr-Fyter Co. 62-63—Eva Luoma. 64—Mary L. Tiers-*Transatlantic News Features*. 65 — Vories Fisher; J. F. Bennett. 66—Joe Munroe. 67—American Cyanamid Co. 68—Joe Munroe. 69—Kosti Ruohomaa-*Black Star*. 70 — USDA; Forsythe-USDA. 71 — Forsythe-USDA. 72—New Holland Machine Co. 73—R. J. McGinnis. 74—Carl Mansfield; Massey-Harris. 75—Fox River Tractor Co.; Papec Machine Co.; R. S. Beese-Penn. State College. 76-77—Elemore Morgan. 78—John Collier. 79 through 81—USDA. 82-83—R. J. McGinnis. 84 — Forrest Borders; R. J. McGinnis. 85 through 87—R. J. McGinnis. 99—Gehl Bros Mfg. Co. 102—The Fyr-Fyter Co.. 118-119—Forsythe-USDA. 132—Carl Mansfield. 138— J. S. Mitchell.

LETTERS (Continued from page 138)

SPINES OR THORNS

Sir:

In the article "Poison in the Pasture" Autumn 1949 by Edward and Virginia Matson, Black Locust, *Robinia pseudoacacia* is said to be thornless. It should be pointed out that branches and sprouts from roots are uniformly spiny at least through the second years growth. Many do not distinguish between spines and thorns and would fail to recognize the species.

K. D. Doak

THE "MAYBE, MAYBE NOT" APPROACH

Sir:

Thought I could get along without *Farm Quarterly* but, no soap, so here's my two year's subscription.

Would like to have it begin with the spring issue if you still have a spare copy, as it contains, among other good things, the best article on fertilizers I have ever read. Aside from the intelligent handling of the subject itself, I get a real chuckle out of the references to the "maybe, maybe not" approach of Government scientists to anything about which they write, and the reasons they have to use this indefinite way of doing things.

I have always held that if the Department of Agriculture would let its scientists prepare the factual data for its Bulletins and the Agriculture Year Book, then turn this material over to writers who know how to put such material into readable and understandable form for the farmers, these publications could be made invaluable. As it now is, such publications are simply an attempt to justify some of the Department's ways of spending public money. They are doing a splendid job, but lack the 'know how' when it comes to telling the common people what is really being accomplished from research and experimental work.

Palmetto, Ga. Fred L. Foster

Send for FREE BOOK

Saucer-size greenhouse mums. 5 breath-taking varieties . . . all featured in our big, colorful 1950 catalog. Also giant English, button, cushion, spoon, exhibition, and other prize chrysanthemums. ROSES, BULBS, SHRUBS . . . hundreds of varieties. Write for our unusual, informative catalog today.

SPRING HILL NURSERIES, Tipp City, Ohio, Dept. K-48

Aeroil

FLAME GUNS

Cracks Rocks
Disinfects
Burns Out Stumps

4 & 5 Gal. 2000° F Flame Kills All Weeds 10 Day Trial

AEROIL
10 Wesley
So. Hackensack
New Jersey

Send for Free Bulletins

FOR BETTER WHITE LEGHORNS BETTER SEE . . . Creighton's

For 25 years we have bred for high hen-housed averages. We trapnest over 8,500 hens and R.O.P. Candidate pullets mated to sires from dams with 275-340 yearly egg averages. The Creighton strain is the paying strain. We annually hatch 800,000 chicks from our own closed flocks. Beautiful 25th Anniversary catalog free.

65,000 LAYERS
12 MILLION EGGS YEARLY
U. S. CERTIFIED
PULLORUM CLEAN

CREIGHTON BROS.
BOX T WARSAW, IND.

EMERGENCY ELECTRICITY

PREVENT LOSSES FROM POWER FAILURE with a low-cost Onan Standby Electric Plant. Equipped with line transfer control it starts automatically when power fails, stops when power is restored. Many models for standby or regular use . . 350 to 35,000 watts.

Model 3CK-1R 3000 Watts, A.C.

Write for Folder

Onan PRODUCTS

D.W. ONAN & SONS INC.
3218 Royalston Ave., Minneapolis 5, Minn.

• SAVES WORK AND TIME
• BUILDS RICH, FERTILE SOIL

A KEMP Power Soil Shredder saves you 90% of the time and hard work of breaking up, mixing and sifting any soil, manure and compost. The KEMP operates fast and smooth, quickly shredding materials, wet or dry, hard or soft up to 20 cu. yds. per hour. Stones are rejected, cannot damage spring steel cutting teeth. Well mixed, aerated, fertile soil produces sturdier, healthier crops, higher yield per acre and saves much of the expense of chemical fertilizers. Priced from $100.

Shredding is adjustable to produce fine or coarse results—as you desire.

Write for full information and Catalog

KEMP MANUFACTURING CO.
Dept. 5 1027 E. 20th St. Erie, Pa.

FARM BOOKS

(Continued from page 14)

present in one volume the available information about the symptoms of malnutrition in plants in such a way that the farmer will find it understandable and useful in diagnosing the fertilizer needs of his soil. The 390 page book is divided into sections describing the hunger signs in our basic crops, tobacco, cotton, corn and small grains, potatos, vegetable or truck crops, deciduous and citrus fruits, and the legumes. Each section is made up of a careful discussion of the different types of nutritional needs of the crop and the effects of deficiencies on the plants. Most of the sections include a key to assist in recognizing the different kinds of hunger signs, and all of them have a selected group of references for further reading on the subject. Probably the most useful tool for deficiency recognition which the book contains are the many black and white and excellent color photographs which show the normal well fed plant and plants suffering from various forms of malnutrition.

Much still remains to be learned about the complex relationship of plant to soil, but, at present, this is the most complete non-technical summing up of the knowledge we have.

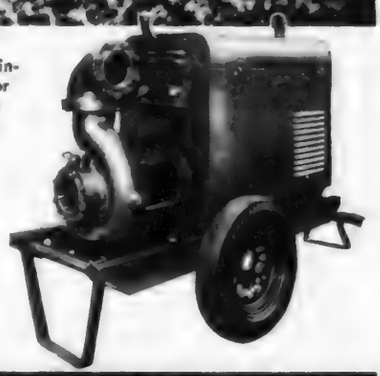
Farm Records and Accounts, by John N. Efferson, John Wiley & Sons, New York. $3.25.

In the spring an older man's thoughts often turn to his bookkeeping as he prepares to fill in Form 1040F and 1040 to satisfy the inquisitive mind of the tax collector. If he is one who has counted on remembering all of his transactions during the year he will probably curse the frailty of the human memory and wish that he had kept records. Others who *have* kept records of their transactions may feel that at last their drudgery is of value.

Dr. John N. Efferson, the author of *Farm Records and Accounts,* would probably say that the man who uses his records for the sole purpose of filling out his income tax schedules is wasting a valuable tool and put him in the same class with a farmer who keeps his tractor in the shed except for a once a year use in plowing the corn land. Dr. Efferson contends that farm records are tools to be used in obtaining greater profits or making larger savings in the operation of the business and if they are not used for this purpose there is no reason for keeping them. He also believes that every effort must be made to keep the farm record system as simple as possible and well adapted to the farm operation so that the farmer himself can handle it without outside help. As he says, "Many businessmen have expressed the opinion that, if farmers would keep records such as other business concerns maintain, they would be much more efficient and profitable. Actually, because of the many differences

Modern

MARLOW IRRIGATION PUMPS



These pumps embody the latest features for modern sprinkler irrigation. Marlows are new—designed especially for today's new pressure and capacity requirements. They will supply water dependably and are thrifty and virtually maintenance-free in operation. Equipped with engines that have the latest safety features.

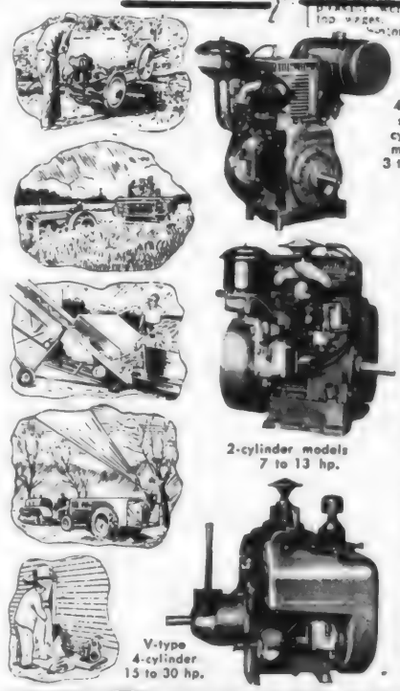
Marlow Centrifugal Irrigation Pumps are available in 12 models, sizes 2- to 6-inch, including two models designed specifically for the new 2- and 3-acre sprinklers. Capacities 50 to 1500 GPM; pressures 30 to 200 PSI. Gasoline and Diesel engine driven. Skid mounted or with steel wheels or rubber tires.

Write for irrigation facts and full information.

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY

Manufacturers of Quality Pumps for over a Quarter of a Century

• • • HARD WORK WANTED



4-cycle single cylinder models, 3 to 9 hp.

2-cylinder models 7 to 13 hp.

V-type 4-cylinder 15 to 30 hp.

for WISCONSIN HEAVY-DUTY Air-Cooled ENGINES

Wherever there's a tough job that can be handled quicker, better, with less labor and more econonomically with engine power . . . the logical answer is a Wisconsin Heavy-Duty Air-Cooled Engine. These hard-working engines don't go by the clock or the calendar. They'll keep on working any number of hours or days or months that the job calls for, in any kind of weather, in any climate, from the hottest to the coldest; from sub-zero to 140° F.

The big reason for Wisconsin Air-Cooled Engine reliability is HEAVY-DUTY DESIGN AND CONSTRUCTION . . . all the way through. Every Wisconsin Engine, from the smallest to the largest . . . from the rugged little single cylinder ABN to the big, husky 4-cylinder Model VP-4 . . . is built to "take it" on hard-work power jobs.

And don't overlook the advantages of dependable AIR COOLING . . . nothing to freeze, no water to boil away. Wisconsin Air-Cooled Engines have a world-wide reputation for delivering "Most H.P. Hours of on-the-job service" . . . and at minimum operating and maintenance costs. That's why it's always a good idea to *insist* on Wisconsin Air-Cooled Engines for your power jobs.

Ask your implement dealer about Wisconsin Engines and Wisconsin-powered equipment . . . and write for free descriptive literature.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14, WISCONSIN

between agricultural and non-agricultural operations, if farmers did keep such records practically all of them would be bankrupt since every farmer would need about two bookkeepers."

In his book, Dr. Efferson presents the various kinds of records and accounts so that the individual farmer can develop an accounting system for his particular farm. Along with this he discusses and illustrates the mechanical operations needed to keep each of the different types of records, again keeping in mind the individual variations that might be used on different farms. And finally he places heavy emphasis on the analysis and use of these accounts in formulating decisions on the farm. In discussing the farm inventory, for example, he shows the difference between the farm inventory and one kept by any other kind of business. He also shows what items go into the inventory; when the inventory is made and how; how quantities and values are measured and how depreciation is shown. He then presents samples of actual farm inventories and how an inventory may be analized and what usable facts revealed. Each of the other farm records are discussed in this way to make a complete and intelligible book which should prove to be useful to farmers.

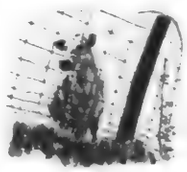
Fertility and Hatchability of Chicken and Turkey Eggs, *edited by Lewis W. Taylor, John Wiley & Sons, New York, $5.00.*

In 1945 the Board of Directors of the International Baby Chick Association set up a research committee with the task of organizing a systematic research program. Leading poultry scientists cooperated in gathering the material and writing it for the practical poultryman in this book, which is the first project initiated by the committee.

The 423 page volume is broken into sections on nutrition of the breeding flock, formation of the hen's egg, fertility in chickens and turkeys, the care of hatching eggs before incubation, biochemistry of the developing avain egg, physical conditions in incubation, genetics and physiology of embryonic development, and diseases in relation to hatchery operations. Though some of the section titles may sound formidible, genuine effort has been made to write a book that can be understood by the layman. As part of this effort the editor has included a gossary of scientific terms that will be of help to the reader. This book is for the professional poultry man; owners of small farm flocks may find it weighty and of little value to their operations.

The Farm Book Store

The Editors of the Farm Quarterly, after a careful selection of current agricultural books, recommend the following to our readers.



Livestock

Feeds and Feeding (21st ed.)—*by F. B. Morrison*.....$7.00
The authoritative book on livestock and poultry feeding.

Dairy Science—*by W. E. Petersen*.....$5.00
695 pages of the best modern dairying practices.

Sheep Science—*by W. G. Kammlade*.....$5.00
The breeds, care and feeding of sheep for wool and mutton production.

Beef Cattle—*by Roscoe R. Snapp*.....$5.00
A carefully revised edition of this excellent book on beef production.

Poultry Handbook—*by Rudolph Seiden*.....$4.95
An alphabetical reference book of poultry information.

Successful Poultry Management—*by M. A. Jull*.....$3.50
A practical book on poultry from brooding to marketing.

Pork Production—*by William W. Smith*.....$5.00
The standard text on the breeding, raising and marketing of hogs.

Swine Enterprises—*by Arthur L. Anderson*.....$3.00
A thorough study of swine raising for the beginner.

The ABC'c of Beekeeping—*by A. I. Root*.....$3.75
The standard reference book on bees and honey production.

THE FARM BOOK STORE D
c/o The Farm Quarterly
22 E. 12th St.
Cincinnati 10, Ohio

I enclose (check, money order or cash) for the following books. Please send them to me immediately.

_____ (Title of book) _____ (Price)

_____ (Title of book) _____ (Price)

_____ (Title of book) _____ (Price)

Name_____

Address_____

City_____ State_____

THE BOOKS WILL BE SENT TO YOU POSTPAID.
Buyers living in Ohio should add 3% to price for sales tax.

Soil and Crops

Soils and Fertilizers—*by Firman E. Bear*.....$3.75
An understandable book on the complex subject of fertility.

Using and Managing Soils—*by A. F. Gustafson*.....$2.80
Fertility, rotation, drainage, erosion, tillage are covered.

Hunger Signs In Crops—*A Symposium*.....$4.50
A review of this book may be found in the Farm Books Column.

Elements of Soil Conservation—*by H. H. Bennett*.....$3.20
A discussion of erosion and exhaustion of soils, by an authority.

Production of Field Crops—*by Hutcheson, Wolf & Kipps*.....$4.50
A new edition makes this the latest work on American field crops.

Vegetable Crops—*by Homer C. Thompson*.....$6.00
The science of producing and handling vegetable crops.

Weeds—*by W. C. Muenscher*.....$6.00
The identification and control of these soil bandits.

Irrigated Soils—*by Thorne and Peterson*.....$5.00
A review of this book may be found in the Farm Books Column.

Farm Management

Modern Farm Management—*by Andrew Boss & G. A. Pond*..$5.00
The principles and application of management to the farm.

Farm Records and Accounts—*by J. N. Efferson*.....$3.25
A review of this book may be found in the Farm Books Column.

Farm Work Simplification—*by L. M. Vaughn & L. S. Hardin*..$2.80
The application of efficiency studies to farm work.

Farming for Profit—*by H. R. Herndon*.....$3.75
A primer for those starting in agriculture.

Success on the Small Farm—*by Haydn S. Pearson*.....$3.00
Subject—how to net $3,000 a year on 10 to 12 acres.

The Farmer's Handbook—*by John M. White*.....$4.95
Easy reference book on crops, livestock, and farm problems.

Farm Mechanics—*by Cook, Scranton & McColly*.....$3.15
A needed reference book on the mechanized farm.

American Farming (4 vols.)—*by Boss, Wilson & Peterson*..$15.00
A comprehensive treatment of the art of farming.

Front Porch Farmer—*by Channing Cope*.....$2.75
Year round grazing in the south, the easy way to farm.

Law on the Farm—*by H. W. Hannah*.....$4.50
An excellent reference on the law as it applies to farmers.

ADVERTISERS' INDEX • SPRING 1950

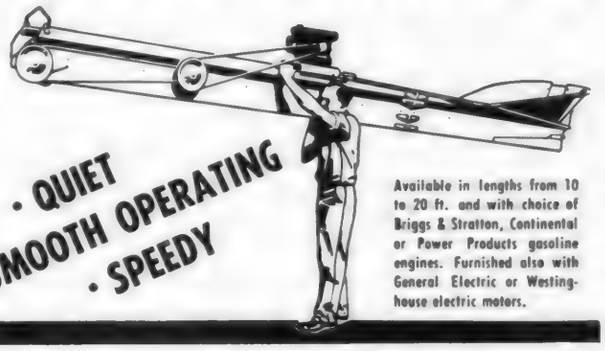
A. C. Spark Plug 18
Aeroil Products Co. 140
Agricultural Laboratories, Inc. 92
S. L. Allen Inc. 112
Allied Mills, Inc. 9
Allis Chalmers Co. 21
Aluminum Co. of America 17
American Aberdeen Angus 140
American Brahman Breeders 112
American Chain & Cable 127
American Corriedale Ass'n. 132
American Fence 115
American Guernsey Cattle 121
American Hampshire Ass'n 134
American Milking Shorthorn 136
American Shorthorn Breeders 128
Anchor Serum Company 90, 114
Ariens Company 114
Associated Seed Growers 126
Atlantic & Pacific 139
Babson Bros. Company 4
C. S. Bell Company 134
Belsaw Machinery Co. 140
Belt Corporation 143
Black, Sivalls, & Bryson, Inc. 113
Boyt Harness Co. 114
Bready Tractor Company 98
Brillion Iron Works 112
Bolens Production Co. 124
Brownell Rose Research 18
Brower Mfg. Company 92
Brown-Forman Corp. 15
Burlingame, Field, Pierce & Brown 132
Buckner Mfg. Company 110
Bussey Products Company 110
Campbell-Hausefeld Company 14, 122
J. I. Case Company 100, 101
Clay Equipment Co. 102
Consolidated Products 10
Crayden Hatchery 132
Creighton Poultry 140
Dadant & Sons 138
Danuser Machine Co. 120
Deere & Company 11
Defiance Tractor Company 96
Doane Agricultural Chemical Co. 135
Dow Chemical Company 12
Dubois Fence & Garden Co. 136
Dearborn Motors 2
Early & Daniel Company 96
Edwards Laboratory 108
Electric Auto-Lite 105
Emlong Nursery 132, 136
Farmer Feeder Company 8
Farmer's Book Club 111
Farm Book Store 142
Farm Service & Supply Co. 120
Firestone Tire & Rubber Co. 3
Ford Trucks 107
Fox River Tractor Co. 93
French Trail Industries 136
Gehl Bros. Mfg. Company 99
Golden Arrow Farm 92
Golden Rule Hatchery 131
The B. F. Goodrich Company 91
Gorman-Rupp Company 122, 129
Goshen Poultry Farm 112
Gravely Motor Plow Company 126
Gulf Hamstery 118
Hall Bros. Hatchery 108
Hartzell Propeller Fan Company 138
Dr. Hess & Clark, Inc. 115
Peter Henderson Company 120
Heston & Anderson Company 106
H. D. Hudson Company 94, 95
International Harvester Co. 1
I-X-L Pump Company 130
Jari Products 122
Irrigation Equipment Company 123
Kelly Bros. Nurseries 124
Kemp Mfg. Company 140
O. W. Kromer Company 88
Lan-Tay Turkey Farm 124
La Motte Chemical Company 121
Lantz Mfg. Company 133
Leach Co. 98
Henry Leuthardt 128
Libbey, Owens Ford Company 89
Lord & Burnham 118
Lodge & Shipley Company 116
Marlow Pump Company 141
Martin Steel Corp. ..... Third Cover
Massey-Harris Company 19
Merchants Creamery 108
Minneapolis-Moline Co. ..... Back Cover
Moto-Power Company 124
Musser Forrest Company 114
Fred Muth Company 138
F. E. Myers Bros. Company 118, 119
National Band & Tag Company 130
National Poultry Institute 118
National Turkey Institute 134
Nears Food Company 16
Nedlar Farms 130
New Holland Machinery Co. 97
Nichols Poultry Farm 136
Nitragin Company 133
Norris Cattle Company 122
Nutritional Research Company 120
Oldfield Equipment Company 130
Oldsmobile Div. General Motors 13
The Oliver Corporation 103
D. W. Onan & Sons, Inc. 140
Opekasit Farm Management 130
Oshkosh Filter & Softener 128
Ottawa Mfg. Company 108
Papec Machine Company 125
J. Parks & Sons 134
Peirson Moore Company 132
Perfection Steel Body Company 14
Pilch's Chicks 128
Plymouth Rock Squab Company 132
Plomb Tool Company 90
Propulsion Engine 14
Quick Mfg. Company 134
Rain-Bird Sprinkler Mfg. Co. 125
Reclaimo Mfg. Company 112
Reynolds Metals Company 6
Rilco Laminated Products 137
Rock Hill Ranch 108
A. I. Root Company 136
Roto-Hoe & Sprayer Company 140
Rototiller, Inc. 144
Roovers Bros. Inc. 134
Rusticraft Fence Company 129
Scott Farm Seed Company 114
Joseph E. Seagram, Inc. 7
Seaman Motors 131
Security Mfg. & Contracting 91
Skinner Irrigation Company 130
Sheley Turkey Farm 122
The Shufelt So & So Seeder 114
Smalley Mfg. Company 128
Smith Agricultural Chemical Co. 123
South Michigan Nursery 140
Spohn Medical Company 132
Spring Hill Nurseries 130, 140
E. R. Squibb & Company 20
Sterns Nurseries 104
Studebaker Corp. ..... Second Cover
Sudbury Laboratories 117
Sunbeam Hatchery 128
Tennessee Corporation 109
Townsends Inc. 114
Universal Mfg. Company 134
J. A. Vogel Company 120
Willoughbys, Inc. 104
Wilmarth Poultry Farm 118
Wisconsin Motor Corp. 141
Woodbine Farms 132
Wood Products Company 135

Farm Quarterly, 22 East 12th St., Cincinnati 10, Ohio

Advertising Offices: NEW YORK CITY. Everett Gellert, 251—4th Avenue. CHICAGO. B. A. Rosenthal, 333 North Michigan Blvd. DETROIT. Clark Stevens, 1630 Guardian Bldg., WO-25005. KANSAS CITY. W. M. Temple, 15 West 10th St. OHIO & INDIANA. Harry Dunnohew, 22 East 12th St., Cincinnati, Ohio. Publisher: Automobile Digest Publishing Corp., Aron M. Mathieu, Vice President; H. C. Dunnohew, Advertising Manager; Joe Pace, Circulation Manager. Member A. B. C. Circulation first half 1949, 164,685.

Rubber Belt MODEL C

HARVEST-HANDLER



• QUIET
• SMOOTH OPERATING
• SPEEDY

Available in lengths from 10 to 20 ft. and with choice of Briggs & Stratton, Continental or Power Products gasoline engines. Furnished also with General Electric or Westinghouse electric motors.

CUTS COLD-WEATHER HANDLING JOBS TO A MINIMUM

This lightweight, quiet-operating elevator with the new rubber belt and rubber flights speeds your handling jobs! All year long the Harvest-Handler makes quick work of those time-consuming tasks.

Rubber-belt model weighs 116 lbs. with 2 HP gasoline engine. Aircraft aluminum-alloy construction combines light weight with strength and durability. Special features keep trough clean and belt running free when handling poultry litter and droppings.

Capacities at a 35° angle in bushels per hour: Ear corn, 340; wheat and soybeans, 450; shelled corn, 475; oats, 640. See your local dealer or write for free folder.

SMALLER CAPACITY MODEL "B" (not shown) ALSO AVAILABLE

BELT

Patent Pending

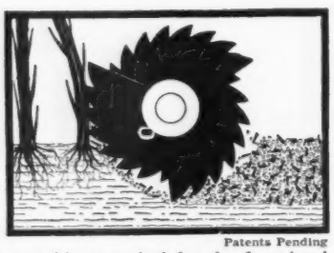
THE BELT CORPORATION

7282 Stahl Road Orient, Ohio

POWER COMPOSTING!
POWER GARDENING!
POWER LAWN MOWING!
POWER SCYTHING!

NOW! all in one revolutionary NEW machine So LOW in price almost ANYONE can afford it!

NEW . . . REVOLUTIONARY . . . WONDERFULLY SIMPLE! . . . THE ROTO-MILLER!



Patents Pending

Here's the new Roto-miller — a rotary cam chopper that makes composting in your own garden by machine practical for the first time! The Roto-miller is shockless—tangleproof—unbreakable! It takes the place of tines, springs, shock absorbers, slipping clutches, cushions . . . and it does a better job!

COMPOSTING BY MACHINE

Right in your garden itself! No more hauling, turning and watering of compost heaps! With this amazing new machine, you can easily chop and mix into your garden soil —without tangling: cover crops, mulches, manure, leaves, weeds, plant wastes of any kind—even cornstalks! Think what this means in labor saved, soil improvement, bountiful crops!

Here is the most important and wonderful news for gardners we have ever had the privilege to announce!

After nearly 20 years of experiment and research, we have perfected a revolutionary new machine, called the Model-T ROTO-ETTE that makes possible a new method of soil preparation and which we believe is destined to make gardening history.

Not only will this amazing machine prepare your garden for planting in one simple operation!

Not only will it cultivate your garden better than any garden machine we have ever seen!

Not only will it mow your lawn beautifully—and with only a simple attachment!

Not only will it function perfectly as a power scythe—and again with only a simple attachment!

BUT—it will also actually chop and mix into your top soil with ease—any cover crop, manure, mulch, plant or animal waste! It will even knock down, chew up and mix cornstalks into your soil!

In other words, you can now do your composting BY MACHINE right in your garden itself! You can do away forever with the back-breaking work of ordinary composting—with all the hauling, turning and watering which has always been necessary!

With this machine you can easily mix so much organic matter and humus into your soil that you can practically do away with using hard-to-get, expensive barnyard manure!

You'll be simply amazed at our low prices! And there is absolutely no other machine at any price which will do the work of power composting which this machine will do!

We can't begin to tell you all about our new machine—how it works—how to use it—all that it can mean to you—details on the attachments, prices, etc. So, we want to send you FREE a copy of POWER GARDENING *and* POWER COMPOSTING.

This fine, well-illustrated book, written by Ed Robinson, author of the famous "Have-More" Plan, will give you the whole exciting story. We will gladly send you a copy FREE—we're so sure you'll want one of our machines as soon as you read it!

Write For This Book Today!

FREE! **Send coupon for FREE BOOK about this wonderful new machine right now!**

ONCE OVER and seedbed is ready to plant! Model T mills ground 16" wide and 7" deep. Plows and harrows in one operation. Low in cost, too!

"BEST POWER MOWER BUILT" — users say. No overhanging wheels — no untrimmed edges! Attachment follows contour of land perfectly!

UNEXCELLED FIELD MOWING —Nothing else like it for cutting hay, tall weeds and trash; does not clog in heavy growth. Unbelievably low in price.

YEAR-'ROUND HELPER! — Model T converts to snowplow in 5 minutes. Other low-cost attachments: power saw, power cart, etc.

ROTOTILLER, Inc.
Dept. F-1
Troy, New York

Please send me FREE by return mail a copy of POWER GARDENING and POWER COMPOSTING.

Your name.....

Address.....

City.....

Zone.....*State*.....

The sleekest, most contented, most profitable dairy and beef cattle feed in

"GREEN PASTURE" ALL YEAR

To provide feed equal to fresh, green pasture all year, profit-minded farmers everywhere are turning to up-to-date grass farming methods. With enthusiastic approval from hundreds of owners of beef and dairy herds, Martin Haymakers and Silos are proved leaders in modern grass farming methods. With fresh green hay and finest silage, you, too, can plan a high-profit feeding program all year . . . the low cost Martin Way!

This letter from a successful Martin user tells the story ➧

November 9, 1942

Martin Steel Products Corporation
Mansfield, Ohio

Gentlemen:

We are now feeding from our Martin Self-Feed Haymaker for the second year. Of our herd of 625 Herefords, 300 are being fed their entire hay ration from our two Martin Haymakers, each of which has a capacity of 75 tons.

Our experiences have proven that the field chopping, haymaker curing method of handling hay is the most practical and economical. When the hay in the windrow is down to around 40% or 45% moisture content, which on a normal haying day requires only a few hours, we pick it up with a field chopper and haul it directly to the Martin Haymaker which we fill immediately. This method of harvesting requires only about 25% of the labor necessary with field curing or baling. Further, it eliminates all field losses due to bad weather conditions.

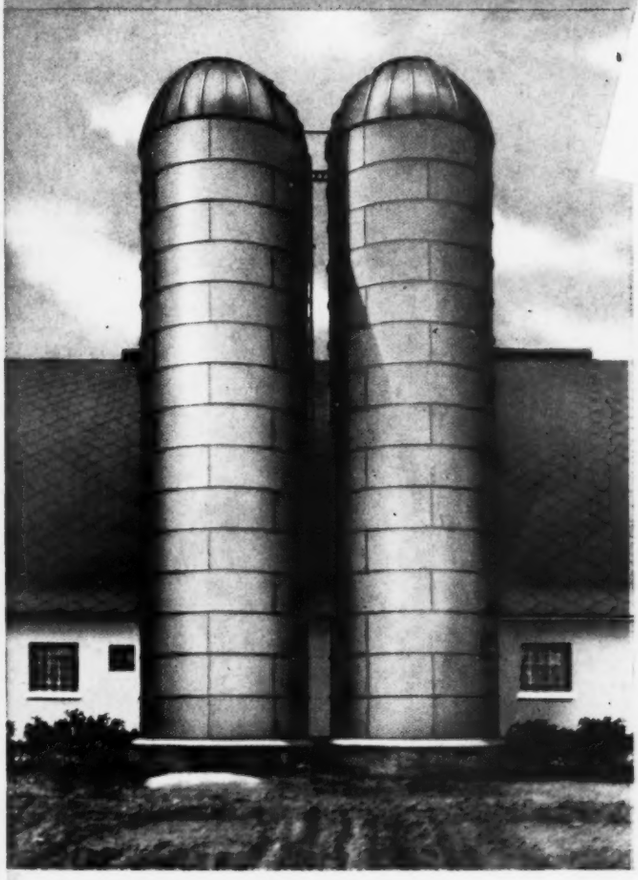
In addition to this great labor saving in making hay, we obtain a further savings in feeding as the cattle eat directly from the Haymaker - we do not have to handle or haul the hay to the cows. The actual time required now to feed the hay is not over 35% of that required to feed baled hay or hay from the mow.

Another very important cost savings from the use of our Haymaker is the high food value of the hay. By filling when the hay is still of high moisture content, no leaves are lost; thus, we capture the full food value of pasture fresh hay. Our cost of protein supplement alone is 50% less during the period that the steers are eating this hay as compared with field cured and baled hay.

It is our belief that the cumulative labor savings and the increased food value of the high quality hay produced by the Martin Haymaker method will completely pay for the installation within two years or less.

Yours very truly,

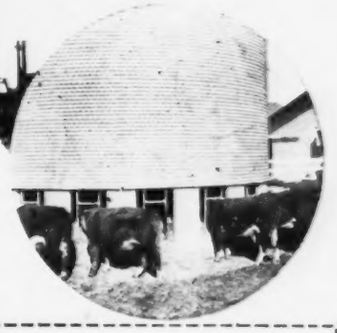
Harry C. Offutt Jr.



The modern, Steel-Bilt MARTIN HAYMAKER . . .

rich green hay all year!

The famous Martin method, forced air curing of *freshly cut* hay, retains all the food value of young grass, increases production of milk and beef with "Spring Pasture" feeding. Eliminate weather worries and field losses; all young leaves are stored for food! Martin Haymaker methods reduce labor as much as two-thirds. *Send coupon for details!*



Finest silage from a MARTIN SILO

Scientific fermentation assures finest grass or corn silage; fragrant odor, rich color . . . and no spoilage. Feed costs drop because Martin silage reduces need for grain feeding. Air-tight walls resist heaviest pressures of grass silage; last a lifetime. *Send coupon for profit-making facts!*

Save time and labor with SELF-FEEDING HAY

A New Idea! *First* with Martin! *Best* with Martin! No carting, no pitchfork labor. Dairy and beef cattle feed "cafeteria style." *Send coupon for details.*

STEEL MARTIN Farm Buildings -BILT

MANSFIELD, OHIO

Pioneers in the design and fabrication of steel buildings exclusively for the farm.

MARTIN STEEL PRODUCTS CORP.
303 Longview Ave., Mansfield, Ohio

Please send me information I have checked below:

☐ "Hay is What You Make It" ☐ Self-Feeding Hay ☐ Martin Silo

Name _____

Street or RFD _____

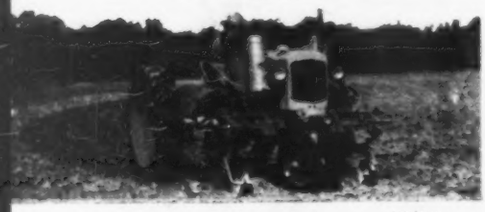
Town _____ State _____

Modern Machines...

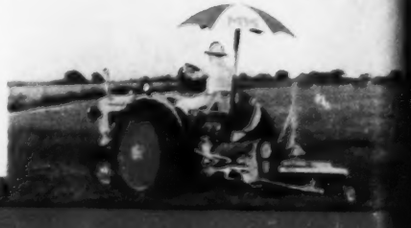
Three bottoms are easily handled under most conditions by the new "Z" Tractor.

The new Z and the TF field cultivator with ground working tools mounted on two rigid frame bars instead of floating gangs.

Three bottom middle breaker on the Universal U. Two bottoms are mounted in front of rear wheels for added traction—third is on drawbar.



Quick-On—Quick-Off design of MM tractor mounted tools makes possible a fast change from planter (above) to cultivator (below).



Built to Improve Production and Prosperity

MM Modern Machines are built to do your work faster, better, and easier . . . get more work out of every working hour . . . reduce your labor and drudgery . . . stand up under rugged field conditions season after season! That's why more and more progressive farmers are making a sound investment in their future by purchasing MM Modern Machines, Visionlined Tractors, and Power Units that are engineered for *more profitable production!*

The ever increasing army of MM owners knows that MM Machines are the *modern* tools to get their crops in on time, *everytime* . . . to harvest all the crop in time, *at the right time*. Neighbors of yours who are MM owners will tell you that their machinery is more economical, has *longer life dependability*, is more easily serviced . . . that MM Modern Machines are *Built To Do The Work!*

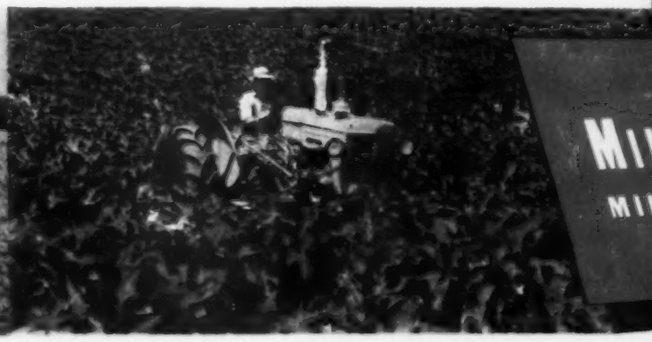
MM MODERN MACHINES THOROUGHLY PREPARE THE SOIL—light-draft Hi-Klearance plows scour well, have wide clearances at every point, and are engineered to do a thorough job of plowing in less time. Ten-inch maximum lift helps prevent dragging trash and stubble at end of field. MM disc harrows prepare the seed bed properly in all types of soils . . . efficiently break up clods, smooth out ridges, and fill up holes without *digging in on turns.*

MM MODERN MACHINES UNIFORMLY PLANT SEED—MM planters get the crop *in on time*, at a uniform depth, and positively regulate amount of seed or number of kernels per hill. MM planters include two-row to four-row checkrow or drill planters, lister planters, fluted feed planters and MM Quick-On-Quick-Off tractor-attached planters . . . types and sizes of *quality* planters for your every need!

MM VISIONLINED TRACTORS PRODUCE PROFITABLE POWER—MM's quality built tractors produce economical, dependable power that can be *instantly* channeled to the drawbar, the belt, power take-off and power lift. Uni-Matic Power—optional on the Z, U, R, and G Visionlined tractors—utilizes tested safety features for both operator and machines, gives operator finger-tip control of tractor-mounted or pull-behind implements. MM tractors pull from 2 to 5 bottoms, offer better vision, high turbulence combustion engines, controlled cooling, positive lubrication, and effective sealing and filtering. MM Power Units offer the same high quality and dependable performance for stationary power requirements.

MM MODERN MACHINES TAKE GOOD CARE OF THE CROP—MM's Quick-On-Quick-Off planting and cultivating attachments equip the modern farm better *at lower cost* for many field tasks. Quick-On-Quick-Off tools save time at end of rows, require less headland, speed up field work, and reduce labor and drudgery.

MM MODERN MACHINES GET ALL THE CROP—MM's famous Harvestors, Huskors, Shellers, and the Bale-O-Matic get all the crop faster, save grain and hay, save time, reduce labor and drudgery. MM's Modern Machines, Visionlined Tractors, and Power Units are *increasing* production and *reducing* the cost of the world's food, fibre, and oil . . . helping modern agriculture contribute to a lasting prosperity and a permanent peace. Ask your friendly MM Dealer how MM Modern Machines can *help you!* . . . complete information and books are available on all MM products—or let us know what machines or size of tractor you're interested in buying during the coming year and we'll send complete facts.



MINNEAPOLIS-MOLINE

MINNEAPOLIS 1, MINNESOTA